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## Making Automobile License Plates

Manifold Chances for Error Being Avoided in Newer Methods—Embossing, Painting, Inking and Baking

BY ROBERT T. KENT\*



VER 22,000,000 automobiles of one kind or another were registered in the United States during 1926. Every car carried at least one license plate, and the great majority of them carried two. According to the reports filed with the Bureau of Public Roads at Washington, the owners of these vehicles paid \$288,282,352 for these license plates.

In the manufacture of the plates there was used, at a conservative estimate, not less than 6000 tons of steel. The number of men employed in their manufacture is difficult to estimate, but to manufacture the 2,225,000 pairs of plates comprising the 1926 schedule of the State of New York, about 100 men were employed continuously from Feb. 1 until the last day of

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the calendar year, and a gang of 15 or 20 additional men were employed on a night shift for a period of six months. It is evident, therefore, that the automobile license plate industry is one of no mean proportions.

To the casual automobile owner, the license plate appears to be a cheap affair, and something that should be comparatively easy to make. Despite its apparent simplicity, the license plate involves some high-class engineering and some rather complex shop problems. In its essential operations the manufacture of a license plate consists of the following operations:

Cutting of the steel blanks, embossing the numerals and letters on the blanks, embossing the raised rim or bead around the edge of the plate, putting on the base color in one or two coats, with a baking following each coat, coating the numerals with a color contrasting with the base color, in one or two coats, with a baking following each coat, sorting the plates into pairs, inclosing each pair in paraffine paper, inserting each pair in an envelope numbered to correspond with the number of the plate, assorting the envelopes with their

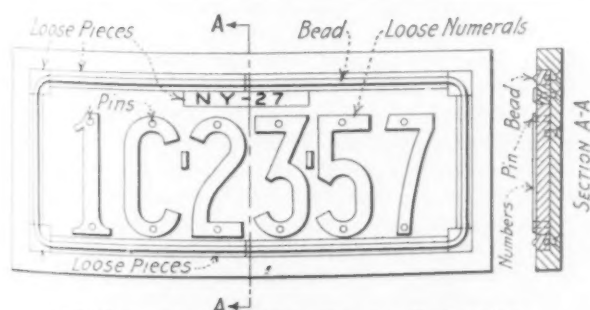
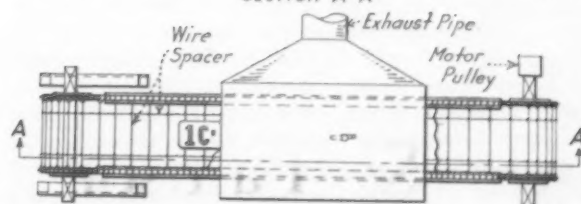
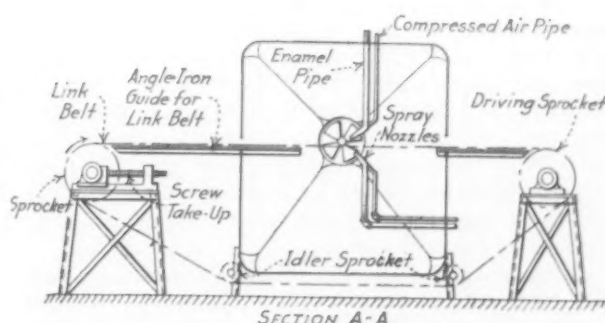


FIG. 1 (Above)—Male Die for Embossing Plates. The numerals and letters, individually removable, are accurately "spotted" by the two pins fitting in top and bottom of each. This die is used in conjunction with a rubber pad

Fig. 2 (Right)—Spray Machine for Putting Base Color on Automobile License Plates. The traveling conveyor brings the plates at predetermined speed under the nozzles spraying enamel upon them



plates into series of 25 consecutive numbers, and packing each series into a correspondingly numbered carton for shipment.

#### Great Chance for Error

In the output of a State like New York, there are over 4,000,000 chances to make an error in each operation, and the chance of discovering errors in any of the last few operations is exceedingly remote until the driver of the car unpacks his new plates at the beginning of the year. It is evident, then, that a high degree of organization is necessary in the shop. In the case of States that, like New York, use a combination of letters and numbers for their plates, the various letters being assigned to different counties requiring a widely varying number of plates, a definite production schedule must be laid out at the beginning of the production period. If this were not done it would be more than likely that, at the time when plates were placed on sale for the following year, many counties would find themselves without plates, while others would have more on hand than they would need until the season of driving for pleasure had opened.

The general public knows practically nothing of the automobile plate industry. The engineering profession knows little more, despite the magnitude of this industry. The reason for this is that, with few exceptions, all the license plates used in the United States are made in the State prisons, and the opportunity to see the plants in operation is limited to a few persons. As a rule, visitors to a prison are excluded from the shops. Therefore, unless one has some business with the prison industries, there is little opportunity to learn of the magnitude of the manufacturing work that goes on behind the walls.

#### Two Methods Available

Although the operations followed are the same in a general way, there are two distinct methods followed in the manufacture of license plates. The difference lies in the manner of embossing the plates, and in the method of application of the base color. The older method of embossing consists in the use of a steel male die, the female being a heavy rubber pad, as contrasted with the more modern method of using an all-steel die. Despite this seemingly simple difference, the substitution of the all-steel die changes the whole process and effects many economies in subsequent operations. In the application of color, the two processes in general use are the spray booth, with separate baking ovens, and the dip process, with a continuous oven for baking, forming an integral part of the operation.

Up to the end of 1926, the State of New York used the older method. For the current year, a modern embossing plant will be used, if the plans which were under consideration at the beginning of 1927 are carried out, the dip process and continuous baking will be adopted at the end of the 1927 production schedule. This will give New York the most modern and complete plant in the country for the manufacture of automobile license plates. Plants of the type that it is proposed to install in New York are in use at the State prisons of New Jersey, Pennsylvania, Maryland, Iowa and several other States.

After a brief discussion of the older method, that was employed by the New York plant, at Auburn prison, and which is still used by a number of other States, the operation of the more modern methods will be taken up in detail. It will then be possible to point out how a study of methods and processes in even so simple a product as an embossed and enameled plate can effect savings that are well worth while.

Bright-finished, annealed steel is used of sufficient ductility to withstand the severe treatment to which it is subjected in the drawing operation in the embossing press without breaking through at the edges of the numerals. Considerable difficulty was experienced

in the past in securing steel that would uniformly stand up under this treatment. But all difficulties now seem to have been overcome, and trouble from this source is rarely encountered.

The steel is purchased either in strips of a width equal to the length of the finished plate, or in blanks sheared to the size of the plate. The former is by far the more economical method, but until a much higher class of shearing equipment than was usually found in prison shops was procured the loss due to improperly sheared plates was greater than the extra cost of the blanks sheared to size. The lesson has been pretty generally driven home, however, that even prison labor can do better work if properly equipped. Now the tendency is to provide equipment at least equal to that found in similar shops outside the prison walls. The practice is becoming general of buying the steel in strips and shearing it to size in the shop.

#### Punching and Shearing to Form

After the plates have been sheared the first operation is to round the corners and to punch the slots whereby the plates are attached to the car. This is done in an ordinary inclined-back punch press, a combination punching and shearing die being used. The die is arranged to cut the round corners on one end of the plate and at the same time to punch the slots at that end. The plate is then turned end for end and the opposite end rounded and punched. In New York, and in many other States, the operators of the punch presses are paid on a piecework basis. They become extremely adept, frequently allowing the press to run continuously, and punching a plate at each stroke.

In the New York State plant at Auburn Prison, the plates are embossed in presses of the Seybold type. These are toggle presses, with a platen that moves out in front of the press at the conclusion of each stroke, so that the dies can be changed without the operator placing his hands in the working area of the press. The dies are of steel with removable numerals and letters, as shown in Fig. 1. Only a male die is used, the female being replaced with a rubber pad. The steel die is mounted on the platen, which is moved upward against the rubber pad when in the working position.

With this type of equipment, the bead around the edge of the plate is embossed at the same time as the numerals, whereas with the type of die to be described later, the embossing of the bead is a separate operation. On the other hand, with the newer equipment, two plates can be embossed at one time, and each plate will be much sharper and clearer than either of the single plates embossed against the rubber pad.

The die consists of a body and a number of loose pieces, the latter comprising the sections of the bead, the State designation and year, and the numerals and letters, which are changed with each pair of plates. A pair of pins in each letter and numeral position serve to locate the characters in the die. These are changed by hand after every second plate has been embossed. Much time and effort has been expended by inventors to perfect an automatic device for changing the characters, but without success.

#### Base Color Applied by Sprays

At present, the plates are given their base color in the Auburn plant in a spray booth, a sketch of which is shown in Fig. 2. The apparatus consists essentially of a pair of link-belt chains, running through a closed compartment, joined together at 4-in. intervals with wire spacers to form a continuous open belt. Spray nozzles, operated by compressed air, are located above and below the belt to apply the color. The upper nozzle coats the front of the plate and applies a considerably thicker coat than the lower nozzle. The plates are piled on a table, in groups of 50, at the feeding end of the machine, and are fed by hand to the chain, which carries them between the two nozzles.



A nice regulation of the speed of the chain with reference to the adjustment of the nozzles is necessary, to insure that just the necessary amount of color will be applied. At the delivery end of the machine a crew of three men is required, two of whom take the plates from the chain and place them in crates for the baking ovens. The third man assists in moving the loaded crates from the delivery table and places the empty crates in position. Two of these machines are necessary to handle the output of plates at the Auburn plant.

In this instance, as is frequently the case in industrial work, it was a minor consideration that made the process of high-speed operation possible. When the plant at Auburn was first installed, the output of plates was less than one-half that of 1926. The speed of the paint machine was low, and it was easily possible

further increased and thus obviated the purchase of additional equipment. As the operators were paid on a piecework basis, there was no objection on their part to the higher rate of output.

The plates at Auburn are baked in electrically-heated ovens, each holding 1200 pairs of plates. Five such ovens are used at Auburn. The time required varies from 1¼ to 2 hr., depending on the color. The plates are baked at a temperature of about 225 deg. Fahr., the temperature being controlled by thermostats.

#### Numerals Colored by Printing Rolls

Color is applied to the numerals by rolling, in much the same manner as ink is applied to type in the printing press. In fact, the process is generally referred to as inking, and the color as ink. Care has to be exercised in the selection of the ink, otherwise it will not

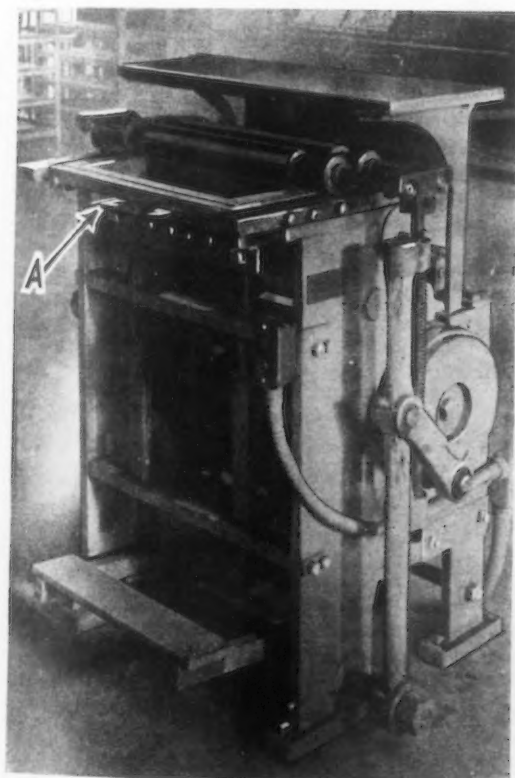


Fig. 3—Inking Machine for Applying the Contrasting Color to Letters and Numerals of License Plates. It operates on the roller principle of the printing press. The plate is held by magnetic chuck on the platen A

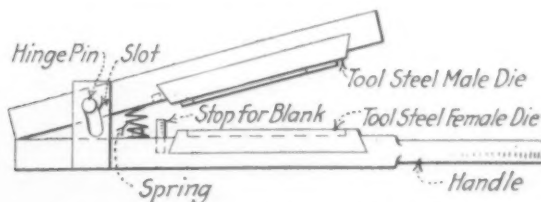


Fig. 4—Tool Steel Male and Female Embossing Dies in a Hinged Steel Frame Are Used in the Latest Process. A crank press of 150 tons capacity furnishes the necessary pressure



Fig. 5—Hinged, All-Steel Parallel Action Dies in Position in the Embossing Press

for the "catchers" to pick up the plates by their edges and place them in the crates. As the speed of the machines was increased to take care of the greater demand, the operators were compelled to grab the plates in any way possible, with consequent finger-printing of the plates. This finger-printing was the cause of much complaint, and a great deal of study was given to means of avoiding it, even to the extent of attempting to design an apparatus that would deliver the plates to the crates directly from the belt.

In the end, the remedy was simple. Each man on the delivery end was furnished a pair of gloves, the thumb and first two fingers of which were provided with pins sharpened to a fine point. The men were then enabled to grasp the plates in any manner that was convenient without making any mark on them except a fine pin prick, which filled up with color before the plates were baked. A valuable by-product of this was that it enabled the speed of the machine to be still

adhere to the base color. Part of the ink specifications read that it must be so constituted that it will, after baking adhere firmly to and become an integral part of the base color. It must be insoluble in all the ordinary solvents, which excludes the cheap inks.

Several years ago an ink was selected on the basis of appearance and price. After about 100,000 pairs of plates had been made it was discovered that the numerals could be wiped off the plate by a cloth dampened with gasoline. Before an insoluble ink was found, the contract price had to be increased four-fold. In addition, all the plates already made had to be washed off and reinked. The cost of doing this was far more than would have been saved by the use of the cheaper ink. The cheapest material is frequently the most expensive in the end.

Several types of equipment are in use for inking plates. At the Maryland penitentiary, a continuous-table machine is employed. The table consists of a

series of magnetic chucks, on which the plates are placed at one end, and which in its movement carries the plates under two or more sets of inking rolls. This machine does first-class work but is of limited capacity.

At Auburn the same type of machine is used as in the plant of the Iowa State Prison at Anamosa. This machine is shown in Fig. 3. The plate is laid on the platen at A, and then is elevated by means of linkage, controlled by the foot treadle, into the path of the ink rollers. If it is desired that no colored border appear on the plate, a mask, covering the bead around the edge of the plate, is set in the opening in the table. The operators become very expert on this machine, and frequently lock the treadle in the operating position and remove and replace plates in the machine without missing a single stroke. At Auburn, a crew of two men operate the machine, one of whom handles the



*Fig. 7—License Plates Emerging from Final Baking at Iowa State Prison. Their position permits immediate inspection and sorting into racks*

plates in and out of the machine, while the other supplies him with plates, places the inked plates in the crate for baking, and at the same time inspects the finished product. Five of these machines are required to handle the New York State supply.

After the plates have received their final baking, they are sorted into pairs, duplicates are eliminated, spoiled plates replaced and each pair is then wrapped in paraffin paper and placed in an envelope bearing a number corresponding to the number on the plates. The plates are finally packed in lots of 25 pairs each in corrugated cartons for shipment.

#### **Running Two Plates of a Pair Simultaneously**

Possibilities of error in the process just outlined are many, and it was partially with the object of minimizing these possibilities that the extensive changes in the Auburn plant were adopted. Some of the possibilities of error in the older process were the embossing of one or three plates of a given number instead of two, the pairing of plates of dissimilar numbers, and the omission of a pair altogether from a series.

The first class of errors is the most common, and in a measure is responsible for most of the others. The

plates being embossed singly, the embosser must necessarily keep track of the number of plates of each number he has made. Toward the end of a day, and with the high speed of operation maintained, the element of fatigue enters, and it is comparatively easy for the operator to change the dies too soon or not soon enough. With the new method, both plates of a pair are embossed at the same time, and the change of dies becomes a matter of routine, occurring with every introduction of a pair of blanks into the press.

Furthermore, the plates so made nest together, which is not the case with plates made singly, and therefore it is much easier to keep the plates of the same number together in subsequent processes. This is extremely important if errors in packing are to be avoided. In the application of the base color in the spray booth, it is almost impossible to keep the pairs together, due to the speed at which they pass through the machine, and to the fact that the "catchers" can each remove only every alternate plate from the conveying belt.

It is attempted to keep all the plates of a group of 25 pairs together in one crate, however, and the crate becomes the unit from this point on. Even this is difficult at times, particularly when errors have been made in the embossing. The sorters and packers handle a single crate at a time and, if all the plates of the original group of 25 pair are in the same crate, the problem of sorting and packing is comparatively simple.

However, if this is not the case, the packer must hold out those plates that have no mate, and locate them before he can complete a carton. The missing plate may be in any one of 50 to 75 crates, so that the difficulties attendant on the correct pairing of over 4,000,000 plates can be readily imagined. The new methods of manufacture, which are in use at the Anamosa, Iowa, plant, and which will probably be used in Auburn next year, remove most, if not all, of these troubles.

#### **All-Steel Male and Female Dies**

The first radical change in the improved method is the substitution of all-steel dies. Of the hinged, parallel-action type, these are shown in Fig. 4. With this type of die an ordinary crank press of about 150 tons capacity is used. Three Niagara presses of this type have been installed at Auburn, to replace five of the old Seybold machines. Three of these have been fitted up to put the beads on the plates after the numerals have been embossed.

Fig. 5 shows one of the embossing presses with the dies in position under the ram. At the right of the press is the box containing the dies, several of each number being assigned to each press. The dies are withdrawn from the bottom of the box, and after use are replaced at the top. In this way the dies are given equal use, and wear equally, thus making plates of more uniform appearance than is possible with the die and rubber pad. The output of the present equipment is over twice that of the older type, due in part to the making of two plates at each stroke of the press, and in part to the ability to run the crank press at a higher rate of speed. All the presses are equipped with safety devices that make it impossible for the operator to get his hand in the path of the descending ram.

#### **Dipping and Baking**

The latest and best method of applying the base color to the plates eliminates the spray booth entirely, replacing it with a dipping process and a baking that is essentially a continuation of the dip. In the plants at the New Jersey and Maryland prisons, the plates are suspended from cross bars carried by a pair of Link-Belt chains, six or eight plates being carried on each bar. The chains carry the suspended plates first into a tank containing the color, and then over a drain



board, where the surplus enamel drains off the plates and flows back to the tank.

With the plates still suspended from them, the chains next pass into the continuous baking oven, which is heated either by gas or electricity, with thermostatic control. Inside the oven, the chains pass over sprockets, which lead them in a series of vertical passes until they reach the rear end of the oven. Then the chains are led forward along the bottom of the oven, encountering a current of cool air flowing in, and emerge at the entering end. They pass under the dip tank and rise at the front of it, where the baked plates are removed and the uncolored plates hung in position for passage through the machine.

At the Anamosa plant the apparatus is somewhat different. Here the dipping is done in a separate machine, and the plates lifted from it and placed on the conveyor of the baking oven. Fig. 6 shows the battery of equipment at Anamosa, with the delivery from the dipping tank in right foreground. This machine oper-

There are several advantages of this type of construction. Where the plates are suspended from the conveyor, with a certain consistency of color, the enamel will flow toward the bottom of the plate and the color coating will be thinner at the top than at the bottom of the plate. To get a uniform thickness of enamel on the plate, it is often necessary to pass them twice through the dip and baking operations, they being suspended in the opposite direction during the second pass. When the plates pass through the machine horizontally, there is no tendency for the enamel to be thicker on one part of the plate than on another. Thus the speed of the operation is increased by the elimination of one pass, and considerable economy of material is effected.

A similar type of oven is used for baking the plates after the numerals are inked. The plates are put on the conveyor directly from the inking machines, thus eliminating one or more handling operations as compared with other methods. The plates, as they emerge

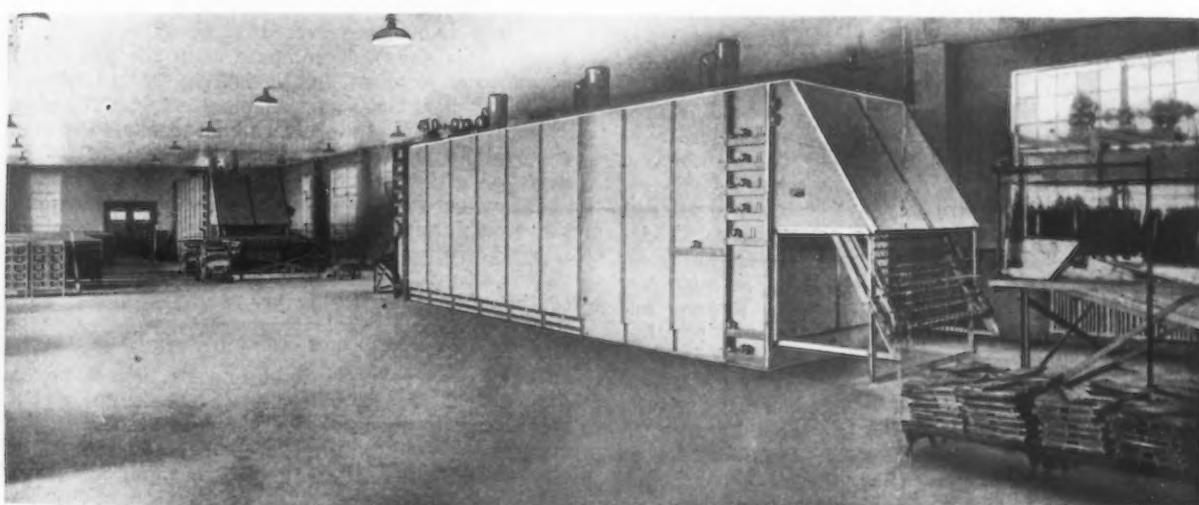


Fig. 6—Battery of Painting and Inking Equipment on Continuous Principle. The delivery rack from dipping tanks is in right foreground, then the first baking oven. Beyond are the "inking" machines for the letters and numerals and the bead, with their baking equipment in the background

ates on the same general principle as those just described, but in construction it is radically different.

In the former machines, the plates were suspended from the carrier as they passed through the oven. In the Anamosa machine the plates are carried on fingers which assume a horizontal position as they enter the oven. Instead of passing through the oven in a series of vertical movements, the plates move along horizontal runs. A mechanical device lifts the plate from the fingers on the conveyor at the end of each run and deposits it on the fingers of the next run below. The plates thus pass through the oven entirely in a horizontal position, and emerge at the back and bottom of the oven.

### Steel Employment and Wages

Iron and steel workers in 207 identical establishments declined by a fraction of 1 per cent in number between March and April, according to figures of the United States Bureau of Labor Statistics. The number on payroll in March was 277,212 and in April 276,333. Despite the reduction in numbers, there was an increase in the amount of weekly payroll of practically 1 per cent. It advanced from \$8,732,626 to \$8,814,297.

In 47 cast iron pipe foundries there was a slight increase in employment, which went from 14,329 to 14,389. Payroll in one week meantime advanced 1.6

from the ovens, are raised by the conveyor fingers to a vertical position as shown in Fig. 7, thus permitting immediate inspection and sorting into the racks, from which they are packed.

The most approved arrangement of plant is a series of units, consisting of a shear, a punch press for rounding the corners and punching the slots, two embossing presses, a rimming press for putting on the bead, a dip tank with its baking oven, and two inking machines with one baking oven to serve them. The operators of the various units are usually paid on a piecework basis, with a bonus for exceeding a predetermined daily or weekly output, and an additional bonus for the crew that has the best output for a week and for a month.

per cent, from \$351,613 to \$357,332. Foundry and machine shop products covered in 996 establishments showed a reduction in employment of 1.5 per cent, from \$256,460 to \$252,494. The reduction in payroll total was considerably greater, being 3.4 per cent. The amount of payroll in one week was \$7,831,040 in March and \$7,564,450 in April.

Machine tool plants showed a decline in both employment and payroll, slightly greater under each head than with foundry and machine shop products. In 156 establishments the drop was from 31,075 hands to 30,498 and from \$958,783 of payroll to \$922,048.



# Available Ore Supply Is Limited

Large Part of World Reserves of Iron Is Not Commercial,  
Owing to Transportation Costs, Expense of Mining  
and Chemical or Physical Composition

BY DWIGHT E. WOODBRIDGE

THERE is plenty of iron in the world, and mines last a long time. While every ton that is won from them depletes the deposits, they continue for hundreds of years. Many centuries may be required to exhaust single deposits of iron ore, and the history of metallurgy in Europe from the dawn of civilization is full of mention of mines that are yet active after long periods of steady production.

Authentic information as to mines that are now extensively worked dates back to the dim ages of the past. Areas on the island of Elba, where the Greeks dug iron about the time Rome was founded, are now being mined, and have been worked almost constantly for more than 25 centuries. Cargoes of this ore come occasionally to the United States. Ore deposits of Styria and Carinthia in Austria, in what was the old Roman province of Noricum, have been mined more or less continuously for more than 20 centuries. Today they are among the more important spathic iron mines and are the basis of a great industry. The supply of ore from the famous iron mountains of Erzberg and Huttenberg shows no sign of final exhaustion after 2000 years of almost constant mining. Mines in Hungary that were active in the first century of our era are still making their annual tonnage. Great antiquity is claimed for the mines of the Ural Mountains, in the province that was known to the Romans as Sarmanthia and where they delved for ores of iron. Mines in Bilbao, in northern Spain, worked in the time of Pliny, are unexhausted and contribute yearly to the exports to Britain, as they have for long periods.

## Old British, Swedish and American Mines

HEAPS of scoria, or iron cinder, in the immediate neighborhood of the English mines in the Forest of Dean indicate that iron was made there when Julius Caesar marched through. The definite mineralogical history of the district dates back to the Norman conquest, and it is still producing a small annual tonnage that no doubt can be maintained for years to come.

In Sweden the mining of iron ore antedates the Vikings, and there is good reason to believe that it began at least as early as the time of Christ. The miners of Norberg, where ore is yet being dug, were granted crown privileges in the fourteenth century. Dannemora was opened in 1488 and is still to be reckoned with. Since mineral statistics were first gathered in central Sweden, about the year 1300, more than 150 million tons have been won, and some of the older producers still have place.

The High Bridge mines of New Jersey were opened in 1700 and have been worked continuously to the present time. The famous Cornwall ore hills of Pennsylvania have produced almost without interruption since 1740 and in a single recent season raised about half a million tons. Quantities of cannon, shot and shell for the Continental armies were made from ore dug at this mine. Ore was first taken from the deposits of Port Henry, N. Y., in 1804, and today the largest works in the United States for the concentration of lean ores are at these mines.

## Present Consumption of Ore Threatens Life of Mines

BUT regions that are opened nowadays, especially in the United States, will not last thus. The pace is too rapid, the demand too great, for long life. Where

the call is insistent, as is the case with the Mesabi range, this will be markedly true.

While it is impossible to make accurate estimates of the total actual reserves of iron ore in the world, authorities generally agree on a maximum of more than 30 billion tons, equivalent to about 10 billion tons of metal. The world consumes from say 100 to about 125 million tons a year, depending on business conditions. Without any considerable annual increase there are known reserves to last approximately 200 years. This does not compare with the expected life of our coal reserves, but it is sufficient to relieve us of any such anxiety as was manifest in Sweden some years ago, when the Government limited the annual exportation of iron because of its fear of an early depletion of international reserves of the mineral.

This figure of 30 billion tons by no means exhausts the possibilities, or what are called the potential reserves; on the other hand, it does not present a true picture of available sources of iron. Many factors and contingencies enter the perspective. Geochemists tell us that nearly a twentieth of the material composing the crust of the earth is iron, which in a few favored spots has been concentrated by nature to such an extent that we call it ore and mine it. A definition of the earth's crust, upon which this computation is made, includes the solid material of the lithosphere to a depth of about 10 miles, together with its liquid and gaseous envelopes of the oceans and the atmosphere.

We know that there are vast areas the iron content of whose rocks is so high as to permit them to be classed as potential reserves—not rich enough to be smelted just yet, but amenable to concentration before smelting; indeed, perhaps by and by available in their natural state, when higher grade ores are scarcer and when methods of reduction may be cheapened. As blast furnace operators become able to use leaner ores than they do now, greater and greater reserves will wheel into line as commercial. The field would be greatly increased were iron makers to use ores ten points lower in iron than now.

## Eighty Per Cent of World Reserves in Five Countries

OF the 30 billion tons of commercial iron ore existing in the world, about 80 per cent is in five countries. In the order of their tonnages these are Brazil and the United States, standing practically on a parity; France, Newfoundland and Cuba. The British Isles and Germany have about 3 per cent each, and Sweden, Spain and Russia about 6 per cent between them. North and South America combined contain some 66 per cent of the world reserves, a fact of no slight moment in a consideration of the future of civilization.

But out of the 30 billion tons called commercial because of its quality, a very considerable proportion is not available. Available ore is such as can be produced profitably by proper mining or treatment, or that can be used profitably in the manufacture of some other article. Hence, an ore of low iron assay may be available because of cheap transportation, easy mining, adaptability for concentration or beneficiation, or from worth in metallurgical processes, while some far richer ore must wait indefinitely on account of its less favorable location or characteristics.

High iron assay is but one of the factors making for usefulness. As the value of a unit of iron is low in comparison with that of other important metals, transportation and other costs govern it to a far greater

extent than with copper, lead or zinc, and still more sharply when compared with tin, nickel, silver or gold.

#### Lake Superior Region Produces Half of World's Ore Output

ALL this is shown from the records of leading ore regions. The Lake Superior district produces half the world's iron ore, the Mesabi range two-thirds of that half. Why this preponderance? It is not because of high grades of ore or comparative ease of mining, for the grades are not exceptional, and while some mines produce by steam shovels from near the surface of the ground, others go 3000 ft., and are to go 4000 ft., into the earth. It is not because of nearness to markets; it is a thousand miles or more from these ore beds to the blast furnaces. It is due rather to the highway supplied by the Great Lakes and its intelligent improvement during the past two generations, and to the further fact that ore and coal could be brought together at points near the Lakes and near a market.

What has held back the vast stores of ore existing in the interior of Brazil? Not grade nor quantity, for they are richer than any others in average of iron content, and are vast in tonnage. It is because of lack of

ness of the country's area helps to solve the difficulty caused by poor quality. Rail and water hauls are short; coal, ore and flux are brought together easily, and the manufactured article need be taken but a few miles to some convenient seaport or consuming center. In England it is hard to find an iron-producing locality where ore and coal are separated by more than 100 miles, while in the United States distances of more than 1000 miles usually intervene between ore and fuel. From the mines of the Mesabi to the coal fields of Pennsylvania and Ohio is more than 1000 miles; low-volatile coal is taken 500 miles to plants of the Chicago district. The average length of haul for all iron ores consumed in the furnaces of this country is not less than 700 miles, and the haul on fuel with which this ore is reduced to metal is about half as far. Every ton of pig iron made in the Pittsburgh district or in the Valleys pays more than \$9 for freights on assemblage of the required materials.

#### Commercial Reasons Measure Availability of Ore

IN short, for every mining region in the world there is the purely commercial reason governing advance or retardation, activity or idleness; and resources that are in themselves on a virtual parity are either devel-

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*MR. WOODBRIDGE has had much to do with iron ore development, particularly on the Minnesota ranges. He points out that much of the commercial ore in the world is not "available." Ore of low iron assay may become available because of cheap transportation, easy mining, adaptability for concentration or beneficiation, or from worth in metallurgical processes, while richer ores must wait indefinitely on account of less favorable location or characteristics.*

*The future of the United States as a great steel-making nation rests on the Lake region reserves, especially on those of the Mesabi range. Without increase in mining, commercial Mesabi ore may last forty years.*

*Plants for concentrating ores are costly, and it will take much mechanical equipment to duplicate the output even of one large Lake region mine.*

*Potential ore reserves reported from various parts of the world frequently prove disappointing. The large stores of iron ore which China was believed to possess could not be found in a recent geological survey.*

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markets and of suitable fuel, and cost of transport.

The factor of transportation may be said to include the general assemblage of all materials and the distribution of all products. Distance of haul is of less consequence than the rate per mile and the development of automatic devices for reducing and quickening handling expense and time.

#### Lack of Markets Retards Newfoundland Production

WHAT maintains so modest a rate of output from the mines of Newfoundland, where the ores are as rich in iron as those of Lake Superior and lie directly on the sea? Neither low grade nor transportation nor excessive mining costs, but markets. Until there is a deep waterway between the Atlantic and the Great Lakes, they cannot reach the interior of the United States, their field is along the Atlantic Coast and in Europe. Over there they have their own ores. The Atlantic seaboard is not yet a considerable consumer, in the sense that Pittsburgh and Lake Erie gulp iron by mines full every month. What has checked production from the three or four billion tons of chromiferous iron ores on top of the ground along the seacoast in eastern Cuba? The cost of manipulation, the lack of fuel, and the difficulty of handling and moving these undried ores in their natural state.

Why did the rich and easily mined ores of Utah so long remain untouched, so that today their development is but beginning? Transportation over long distances and across mountain ranges to any previously existing points of use, and a doubt as to markets—the timidity of money.

Why have the very lean ores of England built so vast a structure of affairs? In this country such ores would serve only to ballast roadways. There the small-

oped to the utmost limit of their opportunity or are lying fallow.

The growth of the iron industry of a country, in relation to its consumption of iron and steel, depends largely on the character, extent and availability of its coal resources. Sweden and Spain are rich in iron but poor in mineral fuel, and they export most of their ore to countries that have abundant and suitable fuels, themselves making but a small amount of pig iron in proportion to their wealth of ores and their populations. Great Britain depends to a considerable extent on imported ores, but she occupies a leading place as manufacturer of steel. She has the coal. The United States is fortunate in that it has within its boundaries widely distributed and abundant supplies of both ore and fuel.

It will be apparent that available iron ore is something quite different from total tonnage. So, while the world at large may have ore of commercial grade to last it 200 years or so, the amount that can be depended on for carrying on is vastly less.

The six or seven billion tons of commercial iron ore existing in the United States is fairly well located for use at present, but not for long. Half of it is close to Lake Superior, where mines, railroads, harbor facilities and ships have been coordinated into a smoothly running machine that has no equal for efficiency. Any further shift of the center of steel making from Pittsburgh toward the west must tend to increase proportionately the requisitions of iron makers upon Lake Superior mines.

Most of the remaining half of commercial iron ore in this country is in the Southern States of Alabama,

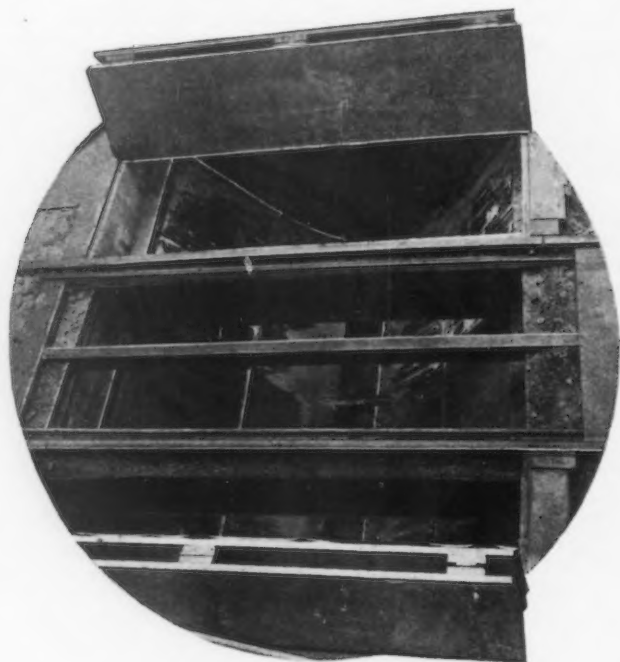
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(Continued on page 1720)



# Handling Foundry Sand and Coke

*Plant of Maytag Washing Machine Has Several Unusual Arrangements*



*Designed for Minimum of Interference—Conveyor System Unusually Complete*

**D**ESCRPTION of the iron handling and melting arrangements of Maytag Co., Newton, Iowa, maker of washing machines, was covered in THE IRON AGE of June 2, page 1587. A new continuous melting unit recently installed at that plant was placed between the old foundry and a large manufacturing building. The present article continues the story of that foundry, and will be followed by other installations at frequent intervals.

For handling incoming raw materials such as sand and coke a receiving hopper has been provided under the railroad track in the yard, as shown in Fig. 1. It will be noticed that this hopper has covers which can be placed over it when not unloading carloads of material. The covers for the flanks or outside edges of the pit have been so arranged that they drop back and form curbs for the sides of the pit, when the material is being dumped into it.

So far as possible all incoming material is brought in in hopper-bottom cars. In the case of sand the entire charge is dropped directly into the hopper, and a pan feeder in the bottom feeds it to the conveying machinery in the building. In the case of coke the hopper should be located slightly to one side, so that the coke slides into the conveyor slowly and the material is raked or shoveled into the hopper as required.

The pan feeder under the hopper shown in Fig. 1 discharges on to another and larger pan feeder, shown in Fig. 2. This is located in the tunnel under the foundry yard. The end of this conveyor can discharge into the boot of an elevator that takes sand to the top of the sand bins under the charging platform. Or, by means of a swinging spout, it discharges on to a second belt which delivers coke to the boot of the coke elevator that takes coke into the storage, to be described later.

When sand is being unloaded it comes up the conveyor shown in Fig. 2 and flows over the end into the boot of an elevator that passes through a concrete elevator casing built in connection with the sand bins. The head of this elevator terminates in the passage immediately below the charging floor, as shown in Fig. 3, the head of the elevator being in the background. The elevator discharges sand on to a belt from which it is plowed off to the right or left into a series of deep bins or silos. These are some 40 ft. in depth, and the discharge openings in all but one of

these bins is on the ground or foundry floor level.

There is one bin, taking up half the width of the structure, that has a discharge opening on the foundry floor level. This bin is used for fire clay for lining ladles and for cupola daubing.

The bins have sufficient capacity to take care of an entire winter's supply of molding sand, core sand and fire clay.

At the end of the belt shown in Fig. 3 is a tailings chute which extends down outside the bin proper and terminates in the small tailings bin, which is emptied after each run of raw material. This arrangement prevents the discharge of a mixed lot of miscellaneous material into the last bin of the series, and the small amount which lands in the tailings bin in each case is wheeled into the plant and used immediately.

The coke used in this plant is by-product coke which has a more or less cubical structure. This coke is handled through the hopper and conveyors already described to an elevator of the continuous bucket type. This elevator takes the coke to a point several feet above the charging platform and discharges it on to a belt suspended from the trusses above the platform, as shown in Fig. 4. In this view the cupola shells are shown on the left and the belt on the right.

This general handling belt passes on into the coke storage and terminates as shown in Fig. 5. Beneath the termination of the general incoming belt is a reversible shuttle belt conveyor as shown in Fig. 5. By means of this, coke can be discharged at any point into the 1000-ton coke storage located on the charging floor level.

By being careful to arrange the coke discharge on to a fairly high face of coke very little breakage takes place and the system has been found efficient for putting this material into storage.

As has already been stated in this series, the location of this plant made it imperative to arrange each separate department so as not to interfere with other departments and, so as to get the maximum production from the minimum ground area. It was for this reason that the 1000-ton coke storage was arranged level with the charging platform and over the section of the plant given up to locker rooms, wash rooms, core ovens and general supplies.

The handling equipment involved in this unit was supplied by R. W. McIlvaine Co., Chicago. The H. M. Lane Co. served as foundry engineer and the concrete work was designed by Henry Raeder, Chicago, the architect of the entire job.

Fig. 1. (At Top of Page) Track Hopper, Which Handles All Incoming Sand and Coke

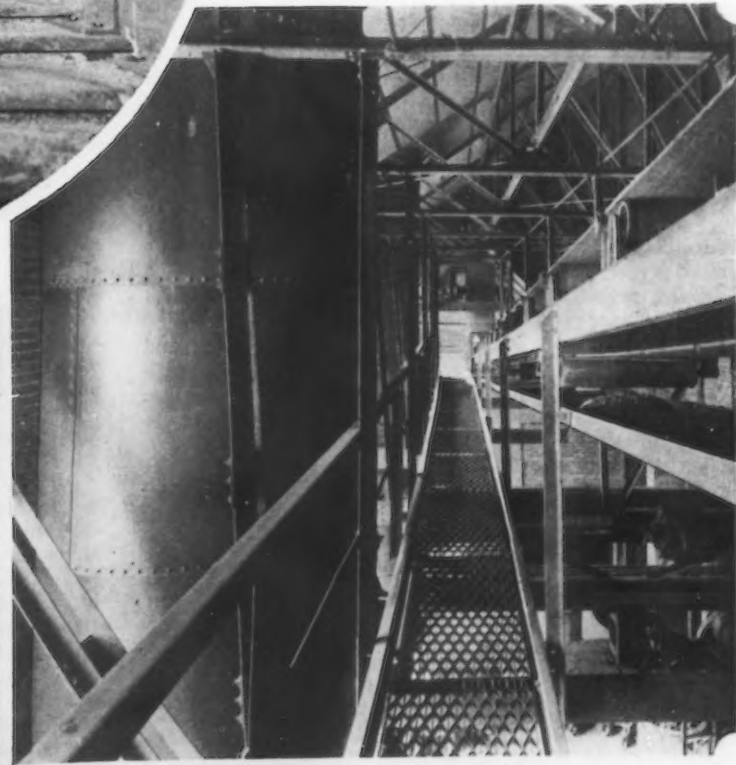
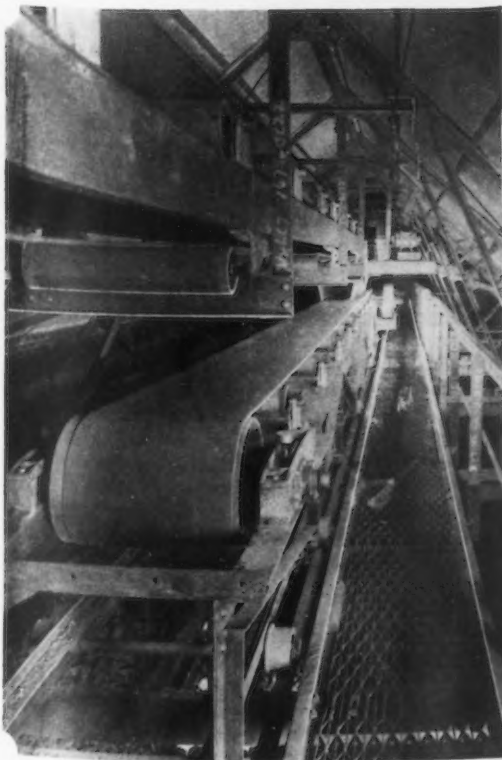


## Parts of the Extensive Maytag Conveyor System

*Fig. 2—Pan Conveyor in Tunnel Under Yard. This conveyor serves to deliver molding sand and coke from the track hopper to the proper elevator in the plant*



*Fig. 3—Sand Distributing Equipment Over Sand Bins. This passage is immediately beneath the charging platform. The incoming sand is discharged on to the belt from the elevator in the background and then plowed off into the various storage bins*



*Fig. 4—Conveyor for Handling Incoming Coke. Supported above the charging platform, this elevator serves to transport coke from the coke elevator to the shuttle conveyor over the coke bins*

*Fig. 5—Shuttle Conveyor Over Coke Bins, Which Delivers Coke to Any Part of the 1000-Ton Coke Storage on the Charging Platform Level*

# More About Fluorspar in the Cupola

Prominent German Makes Rejoinder and Advocates Its Use—  
Sulphur Reduced by Thin Slag, Manganese and Jolting

**A**N abstract of a paper on "Fluorspar in Cupola Practice," by Prof. Wilke-Doerfurt and Bucholz, appeared in the April 17 issue of *THE IRON AGE*, in which the use of this mineral is deprecated—as even injurious to cupola operation in certain phases.

It was to be expected that the Associated Sellers of Fluorspar of Germany would make rejoinder, and they are doing so through Dr. B. Osann, of international repute. Since the advance copy received contains much that is of interest in connection with the use of fluorspar in the foundry, a condensed abstract of the rejoinder in question is given herewith.

## Fluorspar Not Properly Used

Doctor Osann, in discussing the adverse results obtained by the co-authors above mentioned, claims that the fluorspar was not used properly, for a very good desulphurization was obtained with a flux of two-thirds limestone and one-third fluorspar. Only when the proportion of fluorspar went up did bad results eventuate, inasmuch as the cupola lining was badly attacked.

This throws an odd light upon the subject at large. No one in the United States would think of using so much fluorspar in his cupola fluxing—the amount seldom being above 10 per cent. It would seem, however, that organized sales effort on the part of a fluorspar selling combine in Germany has succeeded in setting the line at one-third the total flux charged. Further, the combine has not been anxious to increase this proportion, as an excessive cutting of the cupola lining would introduce enough alumina into the slag to make it thick and less able to take up sulphur.

## Thin Slag Aids Desulphurization

The author further points out that no one has ever seriously claimed desulphurization by the use of fluorspar *per se*, but that desulphurization would take place as the results of a thinning down of the slag with every advantage for sulphur removal by the lime thus brought into more intimate contact with the metal and ash of the fuel. That with good limestone and with care and ability on the part of the cupola operatives, it is not necessary to use fluorspar at all for good melting. Only where the foundryman sees an advantage should he use fluorspar. He can at the same time reduce his total flux to two-thirds of the normal, and have the added benefit of clean melting and no disturbances in slagging-off.

Going into the act of desulphurization specifically, Doctor Osann states that it is a process of segregation. Just as holding the molten metal in a furnace mixer, or carrying it some distance gives time for the formation of sulphur compounds—chiefly manganese sulphide—the same process takes place with cupola iron. In both cases this manganese sulphide and other sulphur compounds, being lighter than iron, will trend upwards and either unite with the slag or form a layer between metal and slag—just as in the case of lead refining.

## Manganese the Important Sulphur Remover

With high manganese in the charges there is always proportionally less sulphur in the result than where lower manganese ranges are used. In fact, manganese is the important sulphur remover, for the presence of slag vitiates the use of soda ash, and the presence of iron oxide in the cupola slag obstructs the formation of calcium sulphide. The latter is shown by the fact that, in the electric furnace, desulphurization can only be carried through successfully with white slags, that is, slags free from iron oxide.

Prepared from the German and commented on by Dr. Richard Moldenke.

Considering the question of sulphur in the cupola, it will be found that we have this element in both coke and iron charged. In burning coke part of the sulphur is converted into sulphur dioxide and part into sulphur trioxide, about 70 per cent of these gases going up the stack and the rest being absorbed by the melting iron, thus enriching its sulphur content. As the drops of molten iron descend and reach the pool collecting on the bottom, the segregation above referred to takes place, and if the manganese sulphide formed has time to rise and be slagged off, it is possible to effect a reduction under special conditions. Thus, with the pool of molten iron kept within the cupola of constant height and the surface just at the slag hole, with specially good limestone and a very thin slag, it is not difficult with rather high-sulphur charges to cut this in half. It is more difficult to effect a reduction when the sulphur is low in the first place.

## Jolting Action Reduces Sulphur

It is a common observation that with very quiet metal this increase of manganese sulphide may not take place. Hence a series of shocks may be necessary to start the action off. This is the basis of the jolting action on the cupola mixing ladle recently brought out. (*THE IRON AGE*, Aug. 12, 1926, page 413.) Also, the transportation of blast furnace metal for long distances, which ends with metal with half the sulphur content. Doctor Osann gives attention to this jolting action in suggesting that with very thin slag, drops of molten metal may project themselves through the slag layer in the cupola readily and give the necessary impulse to start segregation and the upward movement, whereas with a heavy viscous slag, the pellets of molten metal may not go through with any degree of force. It is well known that thin slag never carries iron shot, whereas thick slag, when broken up, usually carries some. Again, with thick slag in the melting zone there must be a retarding tendency on the part of the drops of metal, and hence more time given for sulphur absorption.

## Must Have Proper Proportioning of Lime and Fluorspar

It is unquestionably desirable to have a proper proportioning of limestone and fluorspar when the latter is used. It is not necessary to prove that fluorspar thins the cupola slag when rightly used, as it is well known. The same observation has been made with blast furnace, open-hearth, and electric furnace operation. That fluorine may not be found in such slags is quite possible, for silica takes it up and the compound formed is a gas. However, the question of fluidity is one of mixtures of component parts, and a very small percentage of one material may have far reaching consequences on the product. It is, therefore, difficult to explain why a fluorspar limestone slag is so fluid, even when the fluorine has been dissipated.

Doctor Osann suggests this possibility in that the action of calcium fluoride and silica, which results in the formation of the gaseous silicon-fluorine compound, with calcium oxide as the remainder, has this calcium oxide in the nascent state, and hence acting very powerfully upon any surplus silica remaining behind. If so, then a careful adjustment of the silica and fluorine content of the materials charged would be in order, otherwise an excess of fluorspar would mean too much calcium oxide in the slag, a cutting into the lining, or both. This would mean a thick resultant slag and defective operation. Hence the proper proportioning of fluorspar to limestone would remain a matter of further research, and this in connection with the manganese situation should lead to valuable information.

Roller Shell, at Left, Receives the Shaft and Stationary Field, in Center, and Becomes a Motor-Roller, at Right



## Motor-Driven Table Rollers

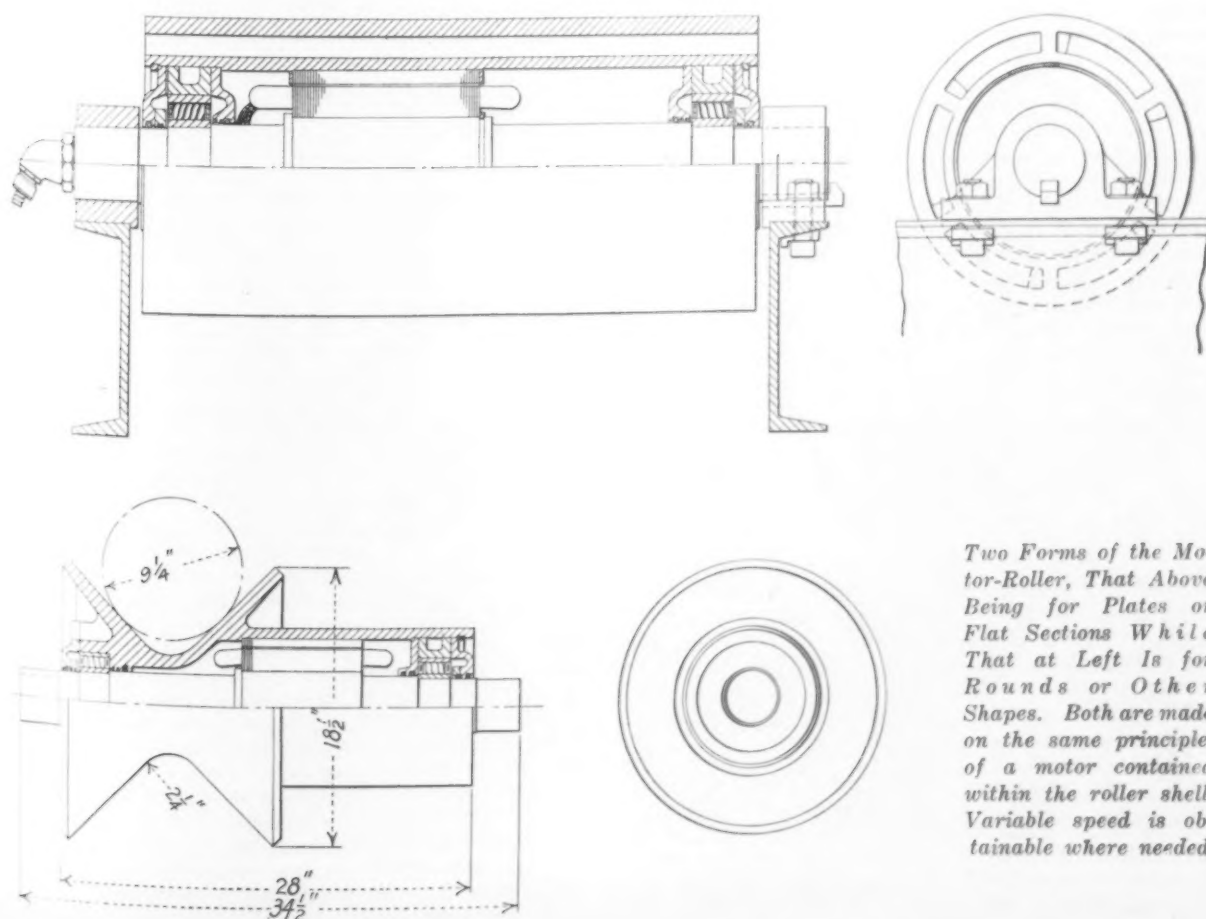
Unique Design in Which Roller Shell Houses Driving Motor—  
Variable Speed May Be Had If Required

TABLE rollers for steel mills, each individually driven by a motor housed in the roller, the latter forming a shell for the motor, is a late development. The motor for the self-contained power unit, designed and built especially for roller table use, is exceedingly rigid. The complete unit is called a "Motor-Roller." The motor is unique in that its construction is the reverse of the ordinary induction motor. A stationary shaft carries the stator core and coils of a 3-phase a.c. motor, while an outer shell containing the rotor core and squirrel cage revolves, thus providing a power unit that serves as a roller.

Mounted at its ends on anti-friction bearings, the shell can revolve freely on the shaft. The connecting

leads from the windings are led out through the shaft to a disconnecting plug. The shaft supports the roller and is mounted on a frame with other similar rollers to form a roller table. The shaft is held from rotating either by a keyway or by having squared ends, placed in a square slot in the housing. As regularly constructed, the roller is dust-tight and can be made water-tight.

Designed for a peripheral speed of 130 ft. to 3000 ft. per min., the speed of the rollers is determined by the number of poles used in the motor winding and the frequency of the supply current. Speed adjustment, if desired, may be obtained by varying the power circuit frequency. This may be done by the use of a



Two Forms of the Motor-Roller, That Above Being for Plates or Flat Sections While That at Left Is for Rounds or Other Shapes. Both are made on the same principle, of a motor contained within the roller shell. Variable speed is obtainable where needed



motor-generator set driven by an adjustable-speed d.c. motor, or by having the alternator driven by the mill motor. The ordinary 25-cycle power circuit will provide for peripheral speeds as low as 500 ft. per min. The motor-roller can be accelerated quickly, permitting rapid reversal. The motor can be designed for frequent reversing at full voltage, without injury.

Motor-rollers may take any heat conditions encountered on roller tables. For handling hot and heavy stocks the rollers are built with double shells made of a one-piece steel casting. Effective insulation against heat is provided by the air space between shells, diagonal vanes between shells increasing the free circulation of air. The rollers may be cooled by forced air ventilation, or by water, if conditions demand.

Present common drives for mill tables are from line shafts through beveled gears. Some mills use rope drives, to eliminate the beveled gears. Individual motor drives from motors mounted on the table frames are used in some plants.

In the gear-driven table numerous bearings must be kept in alinement. Misalinement results in an increase in power requirement, which may be sufficient to burn out a motor. With the Motor-Roller type of table, each roller being an independent unit supported by a stationary shaft, the difficulties of alinement are eliminated, as the self-contained power unit cannot get out of alinement and there is no necessity to keep the table in alinement. As the table is not put to the strains of the bevel-gear drive, and as it is not necessary to keep it in alinement, it is pointed out, its cost can be reduced by using lighter and less expensive table frame construction and lighter foundations.

When, in case of trouble, a roller is disconnected from the power line, it will continue to run as an idler without stopping the mill. The unit construction per-

mits flexibility in arrangement, as the roller table can be curved as desired. The roller can be mounted on springs, in case it is to be subjected to severe shocks.

Numerous advantages are claimed for this type of table. Safety is promoted by elimination of gears and other parts common to the ordinary roller table. Power requirements are estimated at one-fourth to one-half those for the ordinary roller table. Only about 5 per cent as much lubricant is required as for gear drives, as the bearings do not require greasing oftener than once in six to 12 months. The tables take less space than the ordinary roller tables, as floor space is saved by elimination of line shafts, gearing and other parts. The total width of table need be only about 6 in. greater than the length of the rollers. The life of the tables is increased and maintenance costs are cut down.

Developed in Germany, the motor roller is controlled by the Schloemann Co., Düsseldorf, manufacturer of rolling mill and hydraulic machinery. It has been in use in Germany for more than two years. In this country it will be handled by the Schloemann Engineering Co., Empire Building, Pittsburgh.

About the time that the motor roller was being developed in Germany, Willis McKee, engineer and contractor, Cleveland, was working independently in developing a roller embodying the same principle. Mr. McKee is now cooperating with the Schloemann Engineering Co. in putting this equipment on the American market. These units are being built for the Schloemann company by the Reliance Electric & Engineering Co., Cleveland. A set of the motor rollers, now being made for a large steel plant, will be the first installation in this country. An exhibit of the rollers will be made at the meeting of the Association of Iron and Steel Electrical Engineers at Pittsburgh, June 13 to 18.

## Industrial Power Plant Problems Discussed at Erie

A MEETING which paid particular attention to industrial power problems was held under the auspices of the Erie section of the American Society of Mechanical Engineers at Erie, Pa., June 3 and 4. It was scheduled as a Tri-State power meeting, delegations from the Cleveland, Buffalo and Pittsburgh sections of the society participating. The principal papers presented were the following:

"Modernization of Industrial Power Plants," by Major C. G. Spencer, of Baker & Spencer, Inc., New York; "Conditions and Effects of Electric Drive as Compared with Other Methods," by R. H. Rogers, industrial engineering department, General Electric Co., and "Some Fundamental Considerations in the Design of Boiler Furnaces," by Prof. W. J. Wohlenberg and F. W. Brooks, Sheffield Scientific School, Yale University, New Haven. The technical sessions were marked by active and general discussion and certainly were calculated to warrant the holding of regional meetings which may be well attended by members of the society in the locality and which are conducive to a liberal exchange of views and experiences.

Entertainment arrangements were of a broad and varied character and included plant visitations to the numerous industrial establishments of the highly diversified character distinguishing Erie. One of the special entertainment features was a banquet held on the evening of June 3 and presided over by Matthew Griswold, manager of the Erie Works of the General Electric Co. Among the speakers were: Fred R. Low, editor of *Power* and past president of the society, and Miss Kate Gleason, a member of the society and at one time actively identified with the Gleason Works, Rochester, N. Y.

Arrangements for the meeting were in charge of a general committee headed by J. F. Wadsworth, consulting engineer, Erie, with the following as his associates: W. C. Heckeroth, Erie City Iron Works; George W. Bach, Union Iron Works; G. H. Heine, Erie Forge & Steel Co., and W. J. Brenner, Lakeview Forge Co. The chairmen of the various special convention com-

mittees were: F. J. Derby, Erie Foundry Co., registration; A. D. Skinner, Skinner Engine Co., reception; T. E. Durban, transportation; James Burke, Burke Electric Co., inspection trips; Matthew Griswold, General Electric Co., evening meetings; L. V. Reese, Erie City Iron Works, luncheon; R. L. Yates, Skinner Engine Co., sports and entertainment; Alex Jarecki, Jarecki Mfg. Co., finance; G. D. Selden, Erie City Iron Works, publicity, and V. V. Veenschoten, Northern Equipment Co., technical program.

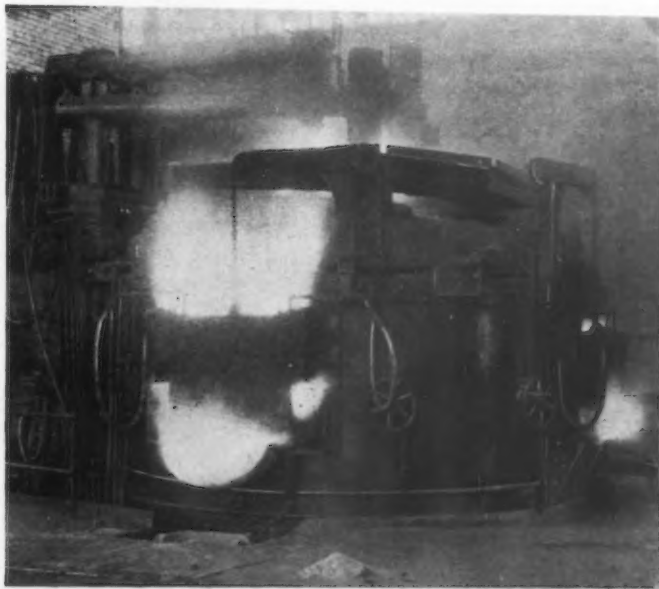
### Welding as a Manufacturing Tool

Mr. Rogers, in his paper outlined some of the broader and perhaps less obvious effects of electricity in industry. He mentioned among other things the effects of welding by electric arc in manufacturing. "The adoption for production purposes of this process which only a short time ago was looked upon as a means for making repairs or as a 'putting-on tool' has been so rapid and far-reaching," Mr. Rogers emphasized, "that the general public and even those more intimately connected with the metal world are as yet unaware of its scope. Arc welding for thousands of products does away with patterns, castings together with casting losses, much of machining and, withal, results in lighter, stronger and better construction. It reduces necessary stocks of materials and parts, and greatly shortens the time from completion of design or receipt of order to the finished article. The electrical manufacturer has not been slow in taking liberal doses of his own medicine; particularly is this true of General Electric where the arc weld has made possible marked reductions in the space occupied, in the time required and in the developments and shop costs of many of our major products."

Major Spencer's paper, which covers a subject given relatively little consideration in recent years and which was well received by the meeting as touching comprehensively on the present requirements of the industrial power plant, will be reviewed at length in a later issue.

# Steel Plant Uses Electric Furnaces

*Eight Three-Phase Arc Units and One Open-Hearth Furnace*



*Worm-Driven Charging Machine and Crane Have Roller Bearings*

Charging Side of 25-Ton Heroult Electric Furnace in Timken Plant, With Transformer Room at Left Behind Brick Wall

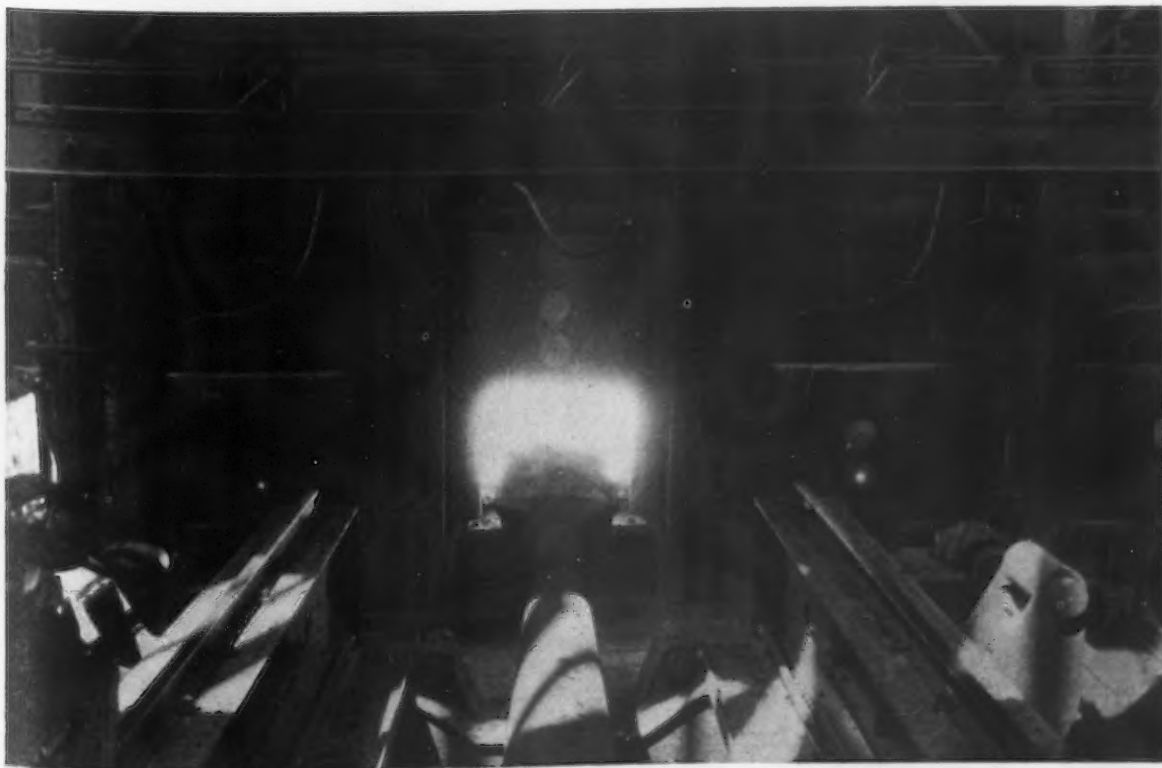
DESIRE for full control over the character of the raw materials entering into its product, which is becoming more common with large manufacturers, led the Timken Roller Bearing Co. some time ago to establish at Canton, Ohio, a complete plant\* for the production and fabrication of its own steel. Comparatively recently the necessity became evident for the enlargement of these facilities, partly because of the rapid increase in the volume of the company's own production, and partly because of a belief, which has been borne out by results, that a considerable de-

mand for a supply of especially high-grade steel existed among other manufacturers of different products who, for various reasons, found it impractical to make or difficult to procure in bulk.

As a consequence a new mill was built, and has just gone into operation, which has been planned on the basis of a tonnage capacity sufficient to meet both of these needs for some time to come. Aside from being practically completely electrified, the mill contains several other innovations in the way of equipment which make it of considerable interest.

One of the two buildings of the new plant houses the furnaces, and the charging and ladle-handling ap-

\*See THE IRON AGE of Dec. 4, 1924, page 1463, for general description.



Operator Has Unusual Visibility in This Charging Machine. This view was taken from his working position in the cab

paratus. Among the latter are two especially noteworthy features, described later in detail. One is the first ladle crane to be equipped with worm drive, and the other a new type of worm-driven charger.† The other building contains the soaking pits, rolling mill, shear and annealing pits, together with the necessary apparatus for handling the ingots and blooms.

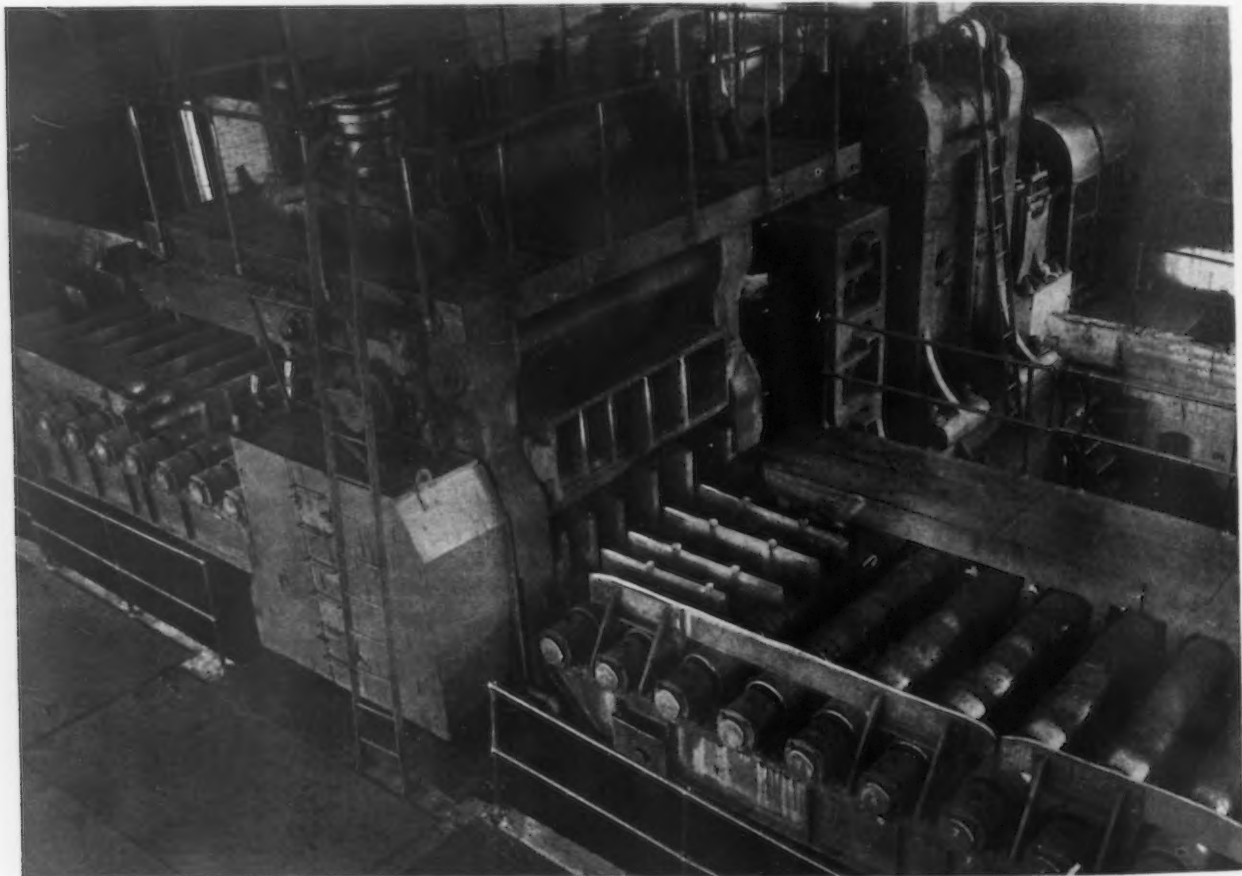
Adjoining the furnace house is a large shed for the storage of scrap to supply the furnaces, handling into and out of cars being accomplished by means of magnet cranes. The two buildings are connected with each other, and with the rest of the plant, by a complete system of broad and narrow-gage tracks, suitable for use either by steam or by gasoline locomotives.

Planned with the idea of increasing to the utmost the speed and convenience of all the operations connected with the production of steel, the furnace building is divided longitudinally into two sections, the charging floor and the pouring floor, each of which

furnace foundations, the control being on the platform above. Not only is the charging floor thus free from encumbrances and obstacles, but the pouring floor is equally free. Ladles can be moved quickly wherever desired, without requiring constant manipulation on the part of the crane operator to avoid other apparatus and equipment.

To operate the electric furnaces, power comes in at 22,000 volts, and is stepped down to the operating voltage of 140-250 by two 7500-kva. and one 3000-kva., 3-phase water-cooled furnace transformers. The transformers are housed in individual brick compartments located alongside of the particular furnace they supply. Automatic electric control for the furnaces is installed in recesses provided in the outside wall of the transformer compartments.

Electric arc furnaces were chosen because their close, automatic regulation, and the absence of oxidizing agents in the furnace atmosphere, insures the



*Three-High Motor-Driven Blooming Mill, Showing Exceptionally Elaborate Guide Boxes for the Various Passes and Complete Inclosure of Gearing*

occupies about half its width. The charging floor is a platform about 17 ft. above the level of the pouring floor. On it are located the charger which serves the open-hearth furnace and the electric furnaces, the transformers which supply power to the electric furnaces, and the offices.

#### *Electric Furnaces Provided*

**F**URNACE equipment includes two 25-ton and one 7-ton 3-phase electric arc furnaces, and one 100-ton open-hearth, all supported on separate foundations, at the level of the charging floor.‡ By virtue of this arrangement, slag pits for the furnaces are dispensed with, and the charging floor is left free for charging operations.

Motor-driven tilting mechanisms for the electric furnaces are located directly back of the individual

exact duplication, both as to analysis and general quality, of the steel produced by every heat.

#### *Unusual Charging Machine*

**B**OTH the electric furnaces and the open-hearth furnace are served by a new variety of charger which is one of the features of the installation. This machine, a low floor-type of 5-ton capacity, is not only the first of its kind to be equipped with worm-gear drive, but is the first to be supplied throughout with standard Timken tapered roller bearings. The construction and operation of the machine are, briefly, as follows:

Trolley frame and end casting are both solid, one-piece castings, the former weighing 36,000 lb. before it was machined. This construction eliminates the necessity for mounting the driving motors and shafts on separate supports bolted to the frame, which are liable to work loose as a result of the severe racking and vibration to which the machine as a whole is subject, and throw the assembly out of alignment.

†Description of the active elements of these two pieces of equipment was published in *THE IRON AGE*, June 2, page 1602.  
‡Older equipment includes five 6-ton electric furnaces, capable of making 250 tons of steel a day.



The charging ram is of forged steel, this material being used as more resistant to heat than cast steel, and consequently having a longer life. The ram is raised and lowered by means of two crankshafts driven by a 40-hp. motor through a worm gear having a speed reduction ratio of 20 to 1. The shafts of both the worm and wheel respectively of the gear are equipped with three sets of tapered roller bearings, the two inboard bearings being of the single, and the outboard, or pinion, bearing being of the double type. The ram is rotated by a 5-hp. motor which drives it through a set of spur gears.

Cross travel mechanism for the trolley is driven through a worm gear by a 30-hp. motor located at right angle to the direction of travel. In this case also both the worm and wheel shafts of the train run on tapered roller bearings, the arrangement for both being the same as that for the hoist gear. Bridge travel is obtained by two 40-hp. motors, one on each side of the bridge, each of which drives its own set of track wheels through a geared line shaft. The shaft and all the wheels are completely equipped with tapered roller bearings. The entire control is of the magnetic time limit variety.

Several striking advantages have been claimed for this machine, the most important of which are, briefly, as follows: Substitution of worm for spur gears has rendered the machine simple, and there-

the floor and the interior of the furnace. This is shown clearly in one illustration.

#### *Ladle Crane Has Worm Gears*

FIRST of its type to be equipped with worm-gear drive and to have tapered roller bearings throughout, the 165-ton ladle crane is the most interesting piece of apparatus on the pouring side of the building. A good idea of its size and construction can be obtained from the illustration. The crane is of the four-



*TWO Views in the Timken Pouring Pit. That at top shows a 25-ton Heroult electric furnace near end of tapping. The electrical gear at top connects with transformers in the brick structure at right. At left is the four-girder ladle crane, which has worm drive and roller bearings*

fore easy both to operate and to maintain. Secondly, both the number of moving parts, and the friction load imposed by those incorporated in the machine, have been greatly reduced, which has in turn made it possible to use motors of a lower horsepower, with consequent saving in power consumption. Also the combination of worm drive and the liberal use of tapered roller bearings has minimized the lubrication expense, besides making the machine much easier running, and thereby lengthening its useful life. Last, but not least, a construction has been permitted which gives the operator an unobstructed view of the end of the ram, the charge,

girder type. In addition to the 165-ton main hoist, it has a 50-ton auxiliary trolley and a 15-ton auxiliary hoist.

A novel arrangement developed for the drive of the main hoist adds considerably to its safety features, besides simplifying its operation and construction. The main hoist driveshaft consists of two sections of equal length butted together, and connected by a flexible coupling. Each section has a 110-hp. driving motor at the far end, which is connected through a flexible

(Concluded on page 1714)

paratus. Among the latter are two especially noteworthy features, described later in detail. One is the first ladle crane to be equipped with worm drive, and the other a new type of worm-driven charger.† The other building contains the soaking pits, rolling mill, shear and annealing pits, together with the necessary apparatus for handling the ingots and blooms.

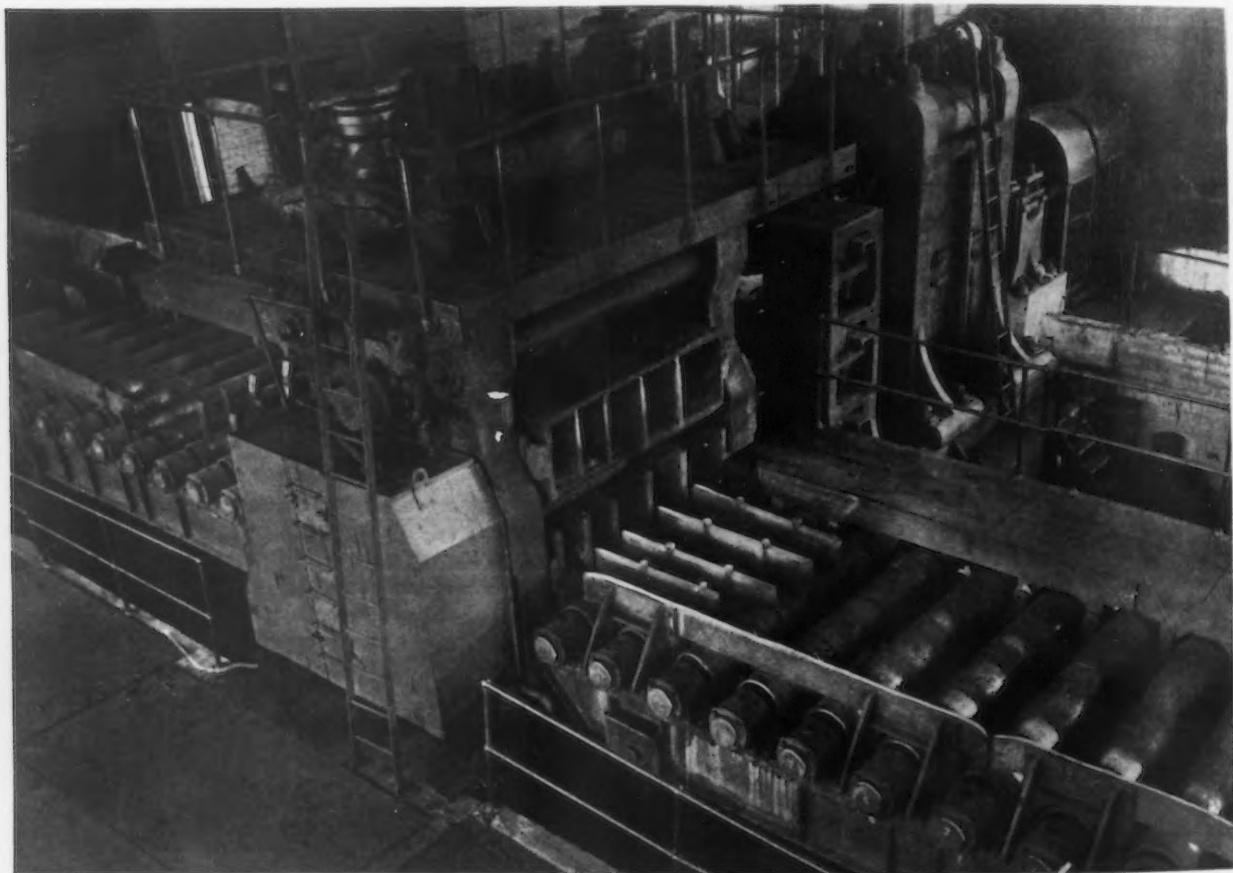
Adjoining the furnace house is a large shed for the storage of scrap to supply the furnaces, handling into and out of cars being accomplished by means of magnet cranes. The two buildings are connected with each other, and with the rest of the plant, by a complete system of broad and narrow-gage tracks, suitable for use either by steam or by gasoline locomotives.

Planned with the idea of increasing to the utmost the speed and convenience of all the operations connected with the production of steel, the furnace building is divided longitudinally into two sections, the charging floor and the pouring floor, each of which

furnace foundations, the control being on the platform above. Not only is the charging floor thus free from encumbrances and obstacles, but the pouring floor is equally free. Ladles can be moved quickly wherever desired, without requiring constant manipulation on the part of the crane operator to avoid other apparatus and equipment.

To operate the electric furnaces, power comes in at 22,000 volts, and is stepped down to the operating voltage of 140-250 by two 7500-kva. and one 3000-kva., 3-phase water-cooled furnace transformers. The transformers are housed in individual brick compartments located alongside of the particular furnace they supply. Automatic electric control for the furnaces is installed in recesses provided in the outside wall of the transformer compartments.

Electric arc furnaces were chosen because their close, automatic regulation, and the absence of oxidizing agents in the furnace atmosphere, insures the



*Three-High Motor-Driven Blooming Mill, Showing Exceptionally Elaborate Guide Boxes for the Various Passes and Complete Inclosure of Gearing*

occupies about half its width. The charging floor is a platform about 17 ft. above the level of the pouring floor. On it are located the charger which serves the open-hearth furnace and the electric furnaces, the transformers which supply power to the electric furnaces, and the offices.

#### *Electric Furnaces Provided*

FURNACE equipment includes two 25-ton and one 7-ton 3-phase electric arc furnaces, and one 100-ton open-hearth, all supported on separate foundations, at the level of the charging floor.‡ By virtue of this arrangement, slag pits for the furnaces are dispensed with, and the charging floor is left free for charging operations.

Motor-driven tilting mechanisms for the electric furnaces are located directly back of the individual

exact duplication, both as to analysis and general quality, of the steel produced by every heat.

#### *Unusual Charging Machine*

BOTH the electric furnaces and the open-hearth furnace are served by a new variety of charger which is one of the features of the installation. This machine, a low floor-type of 5-ton capacity, is not only the first of its kind to be equipped with worm-gear drive, but is the first to be supplied throughout with standard Timken tapered roller bearings. The construction and operation of the machine are, briefly, as follows:

Trolley frame and end casting are both solid, one-piece castings, the former weighing 36,000 lb. before it was machined. This construction eliminates the necessity for mounting the driving motors and shafts on separate supports bolted to the frame, which are liable to work loose as a result of the severe racking and vibration to which the machine as a whole is subject, and throw the assembly out of alinement.

†Description of the active elements of these two pieces of equipment was published in *THE IRON AGE*, June 2, page 1602.

‡Older equipment includes five 6-ton electric furnaces, capable of making 250 tons of steel a day.

The charging ram is of forged steel, this material being used as more resistant to heat than cast steel, and consequently having a longer life. The ram is raised and lowered by means of two crankshafts driven by a 40-hp. motor through a worm gear having a speed reduction ratio of 20 to 1. The shafts of both the worm and wheel respectively of the gear are equipped with three sets of tapered roller bearings, the two inboard bearings being of the single, and the outboard, or pinion, bearing being of the double type. The ram is rotated by a 5-hp. motor which drives it through a set of spur gears.

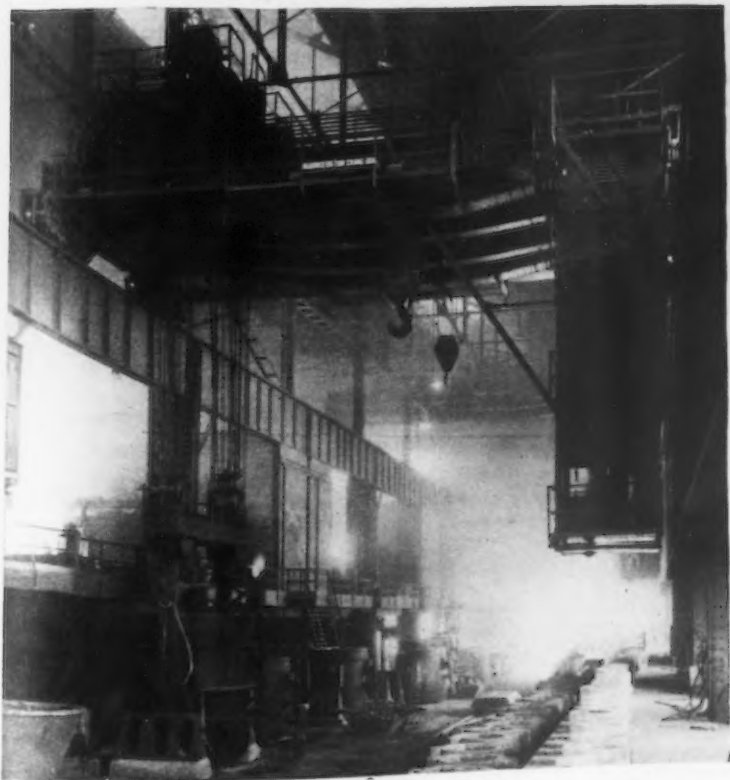
Cross travel mechanism for the trolley is driven through a worm gear by a 30-hp. motor located at right angle to the direction of travel. In this case also both the worm and wheel shafts of the train run on tapered roller bearings, the arrangement for both being the same as that for the hoist gear. Bridge travel is obtained by two 40-hp. motors, one on each side of the bridge, each of which drives its own set of track wheels through a geared line shaft. The shaft and all the wheels are completely equipped with tapered roller bearings. The entire control is of the magnetic time limit variety.

Several striking advantages have been claimed for this machine, the most important of which are, briefly, as follows: Substitution of worm for spur gears has rendered the machine simple, and there-

the floor and the interior of the furnace. This is shown clearly in one illustration.

#### *Ladle Crane Has Worm Gears*

FIRST of its type to be equipped with worm-gear drive and to have tapered roller bearings throughout, the 165-ton ladle crane is the most interesting piece of apparatus on the pouring side of the building. A good idea of its size and construction can be obtained from the illustration. The crane is of the four-



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# Cost of Machine Tool Service

Demand for Special Tools and  
on Builders—Prices  
Engineering

BY FRED A.

**D**EMAND for high production in industry has greatly reduced the use of standard tools and machines. In many cases, instead of using standard machines, industry has demanded semi-standard machines or special machines and particularly special tooling equipment. This change in the character of the demand for machine tools has brought into being so-called "machine tool service."

Some years ago our company realized that there was a great need in industrial plants for an intensive study and a common-sense, thorough application of the fundamental principles of milling. The thought was that by such a study it could render a service to its customers in increasing the productivity of machines in their shops. As a result, our engineering service department was organized. The rapid and steady growth in the demand for this service is shown in the accompanying chart.

## Close Cooperation Between Builders and Users in Developing Tools

As the intensity of competition increases in the building of automobiles or any other product, the user of machine tools examines his manufacturing methods more critically and more carefully investigates tools to find those that will increase his production at the lowest possible cost. This analytical attitude on the part of the buyer of machine tools has become more pronounced in recent years. During this period many machine tool manufacturers have closely cooperated with engineers in industrial plants to bring about the results desired. Through this collaboration many valuable ideas have come from the engineers in industry. They have suggested improvements in design and automatic features that apply to their work. These features have been profitably put on machines as standard features to the benefit of all users of machine tools. New types of tools have been suggested as well. The quickening influence on the machine tool maker has

resulted in more frequent changes and improvements in design.

In some instances new machining methods have been evolved. As an example of this, the so-called centerless method of grinding on a large class of work has wrought a marked change in grinding practice. In many instances this new method has not only greatly increased output per operator, but has made it possible to secure a degree of accuracy not heretofore obtainable on production work. It has also permitted the grinding of materials and parts for which heretofore there has been no method available for grinding at all. In some cases centerless grinding has been made possible by minor changes in the design of the work, eliminating operations on as many as five of the machines formerly used.

Other concrete illustrations of what cooperative study between the user and maker of machine tools has brought about both in the design of the machine tool itself and in the machining methods follow.

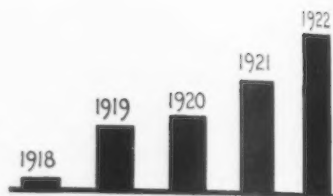


Fig. 1—Engineering Service Rendered by Co. Has Increased

\*President Cincinnati Milling Machine Co., Cincinnati.

Fig. 2—A Centerless Grinder, a Machine Which Has Wrought a Marked Change in the Grinding of Balance Staffs, as Well as Many Other Parts

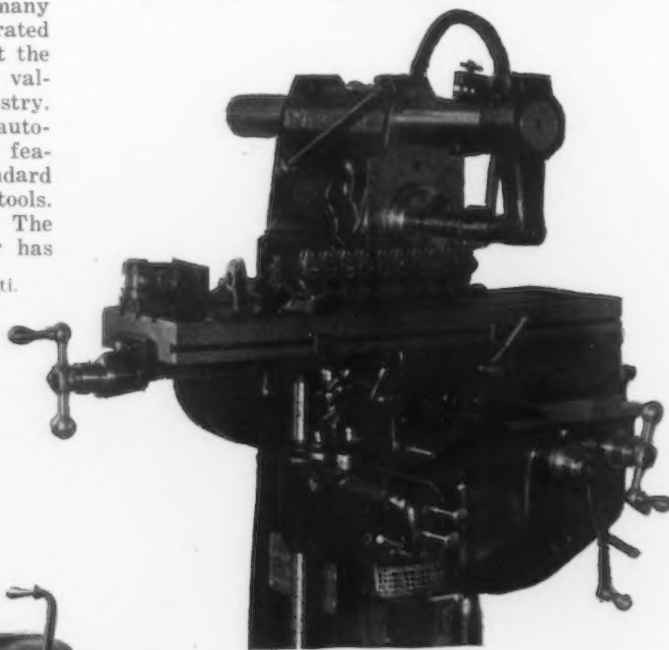
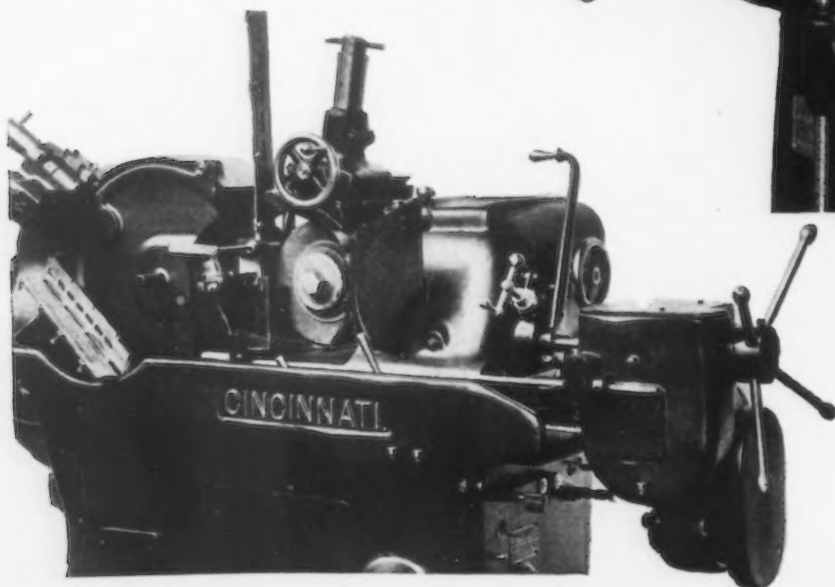
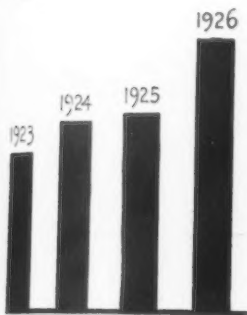


Fig. 3—A Standard Milling Machine With What Was Considered a Good Set-Up in 1913

# Shows Marked Increase

Fixtures Puts Growing Burden  
Do Not Cover Extra  
Effort

GEIER\*



the Cincinnati Milling Machine  
Sharply Since 1918

In 1918 the milling machine in Fig. 3 was considered satisfactory to handle the job shown. This is a standard machine with a simple work-holding fixture mounted on the table. Although introduced in 1913 and widely used during the war on high production work, it was not until some years later that manufacturers recognized the value of using a machine of an automatic type.

The index base method of milling and the application of a multiple gang of cutters is shown in Fig. 4. This size of automatic machine has been used extensively by industry in post-war production period.

A further departure is shown in Fig. 5. This machine has two vertical overhead spindles and one vertical spindle coming up from below.

## Decline in Use and Increase in Cost of Standard Machines

An example of the very special engineering service required today is to be seen in Fig. 6. Here the only part of the machine that is standard is the base. The spindle carriers and headstock are special. The over-

head mechanism and the fixture to hold the piece have been worked out by the engineering service department of the maker in cooperation with the user.

These examples have been cited to show briefly the trend from the standard machine to the semi-special and almost entirely special machine. These more or less special applications with their increased productivity have cut down the use of standard machines, incidentally increasing the cost of the manufacture of standard tools.

Semi-standard or completely special machines present complex problems both in design and in manufacture. Because of these difficulties it is not a simple matter to figure the cost of such equipment, and much work of this character is done not only without a commensurate profit, but frequently with no profit at all and some times at a loss.

## Sharp Increase in Engineering Staffs

To meet the demand for special engineering service and the more frequent changes in design, most machine tool plants are working today with greatly increased staffs of engineers. These men are engineering graduates of technical schools and universities, but have had a thorough training in tool design, machine methods and time study work. In designing special machines and special machine equipment, detailed estimates are worked up for customers, giving them complete data to help them determine whether the new methods and the new machines will prove to be a profitable investment. It frequently happens that after all of this work has been done, a complete change in ideas and sometimes the abandonment of the project render all the time and money spent on the proposition of no avail.

In the manufacture of high production fixtures and machines extreme care is required in the selection of materials and an unusual high quality of workmanship is called for. It is exceedingly

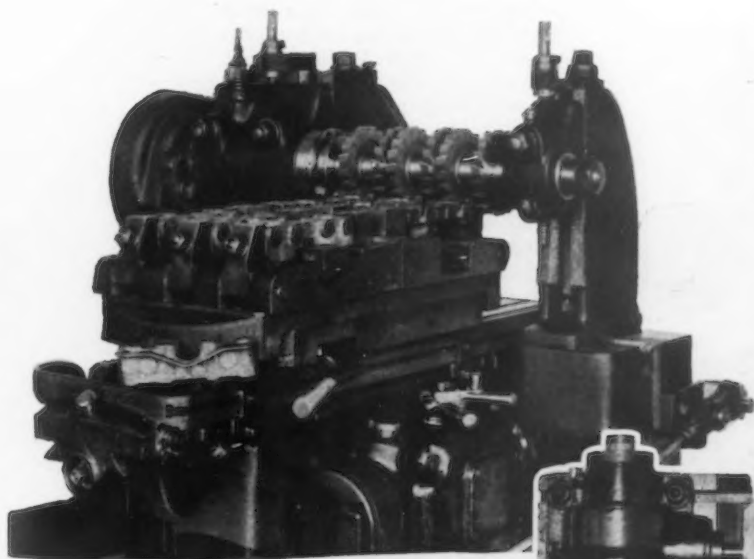


Fig. 4—The Automatic Machine Is Coming Into Wider Use—a Standard Machine With Special Work-Holding Fixtures

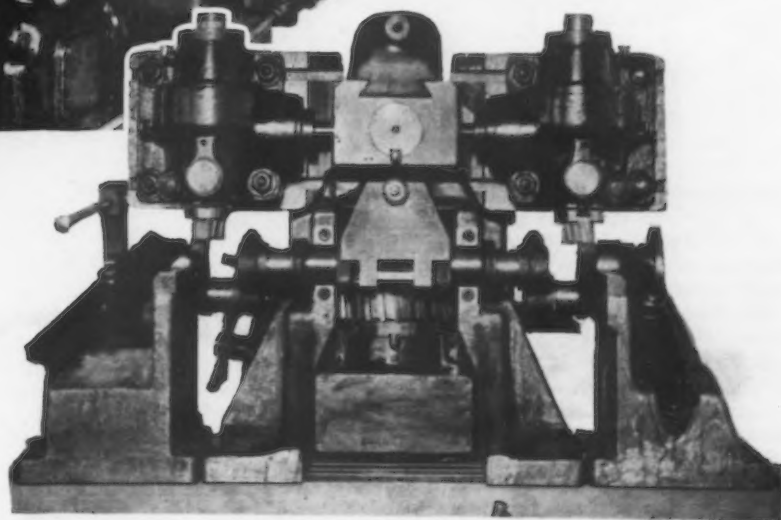


Fig. 5—A Machine With Special Cutter Heads, Having Two Vertical Overhead Spindles and One Vertical Spindle Coming Up From Below

difficult in estimating the cost of a special machine or special equipment to arrive at an accurate figure from a preliminary sketch or layout. Frequently in testing out the special machine or tooling equipment with the actual parts to be machined, "new information" reveals difficulties that could not be foreseen. All of these factors make it increasingly difficult to make a profit on this branch of the business.

#### Personal Service Rendered in Customers' Plants

Many machine tool manufacturers have placed their own specialists or service department engineers at the disposal of their users. These men go directly to the customer's plant, make a survey of work to be done and offer their recommendations on the spot. Frequently chief engineers and their assistants and executives of machine tool plants themselves spend considerable time in the customer's plant in order to render the best possible service expeditiously. Beneficial results also have been obtained by bringing to the machine tool builder's plant those in the user's organization who are responsible for improving methods.

#### Other Machine Tool Builders' Comments on Service

A manufacturer making, among other products, automatic or rapid production lathes finds that the percentage of machines furnished with special features and tooling equipment, in comparison with total sales, is increasing each year. In each case the manufacturer submits first a production estimate made up in a simple, yet efficient, manner. On certain machines, however, it is generally necessary to make a complete tool layout to scale, showing the fixtures and positions of the tools. There is a constantly increasing burden on the engineering service department for this sort of work.

At the present time, about 45 per cent of the lathes shipped are furnished with special tool equipment. The standard engine lathe business is decreasing correspondingly. The semi-automatic or automatic multiple tool lathes take the place of several standard en-

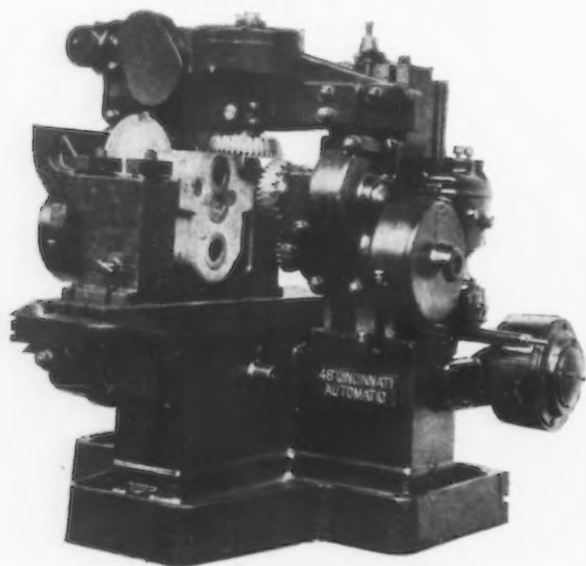


Fig. 6—This Machine Is Standard Only in Its Base. The spindle carriers and head-stock are special. The overhead mechanism and the fixture to hold the piece were worked out in cooperation with the user

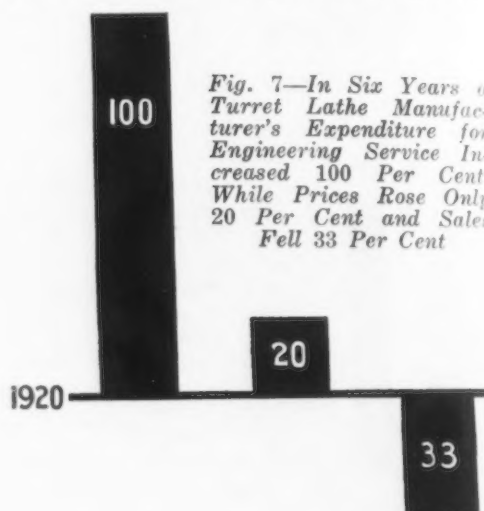
gine lathes, making it possible for this manufacturer to sell only one standard lathe, whereas before he sold three. The designing of all the special tool equipment, however, is expensive, requiring an increased personnel. The cost of engineering and the subsequent installation and testing out of the equipment frequently leaves little or no margin of profit.

A manufacturer of gear cutters who was approached on this subject, while not having the same problems, does have occasion to furnish special fixtures which make his machines semi-special. He feels that engineering service should be encouraged and that it is a valuable help in the sale and use of machine tools. Frequently, he states, the recommendations of the

manufacturer are used to increase production on old machines.

#### Service Cost Goes Up 100 Per Cent in Six Years

There are many manufacturers in our industry who share the viewpoint of an executive in a turret lathe plant, who feels that calls for engineering service should be encouraged, but that machine tool builders



should be able to secure a price commensurate with the extra cost involved. A great growth in his plant in the demand for engineering service from his plant is shown in Fig. 7. A much smaller growth is indicated in the price for the machine tools, and a very decided decrease is evident in the actual volume of sales. In other words, while the volume is being decreased, prices have advanced but little, and engineering service has increased 100 per cent. These are facts that deserve careful consideration on the part of all users of machine tools who have been enjoying this kind of service. The demand for, and the cost of, service are increasing at a faster rate than the prices paid for the tools, the result being reflected in lower profits.

Engineering service should not only be continued, but still further developed. However, to encourage the further development of the machine tool itself, as well as service which has been discussed, it is obvious that the machine tool builder must be reasonably compensated. I believe that intelligent buyers of machine tool equipment and users of this kind of service are willing to pay all increases in price that are fully justified. It is important, however, for the machine tool builder to see that the quality and the productivity of his machines are steadily improved. Not only must the machines be made more productive, but they must "stand up" to new requirements of today's high production manufacturing methods. Service rendered industry must be thorough and worth while.

H. W. Grant, of Youngstown, receiver for the Struthers Furnace Co., operating a merchant stack at Struthers, Mahoning County, announces that claims against the former management, headed by W. C. Runyon, of New York, have been settled for \$95,000. By terms of the settlement, the receiver will shortly receive \$60,000 from the sale by Mr. Runyon of real estate in the residential section of Westchester County, N. Y., and a mortgage for the balance. This action paves the way for the financial reorganization of the company. At the present time, the company's blast furnace is idle. It is possible that it may be started during the latter part of the year, providing improvement is shown in the pig iron market.

The Midland Steel Products Co., Cleveland, has obtained exclusive rights to the manufacture and sale of a new automotive brake. Plans are now being perfected for putting this brake into production within a few weeks, according to President E. J. Kulas. It will be manufactured in sizes to fit the popular run of cars on the market. John Sneed, Detroit, is the inventor of the brake, which is known as Steeldraulic. It is mechanical and operates internally.

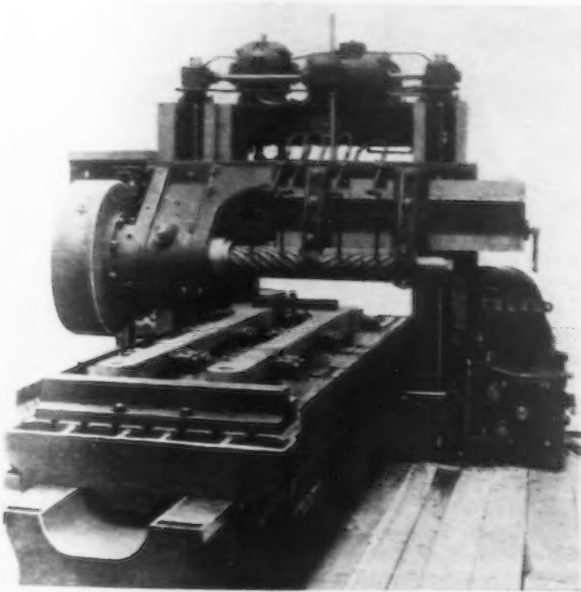


## HEAVY ROD MILLING MACHINE

### Features of Improved 58-In. Unit Include Independent Cross-Rail Down-Feed

**A**n extra heavy rod miller of improved design has been brought out by the Niles Tool Works Co., division of the Niles-Bement-Pond Co., 111 Broadway, New York. The distance between the housings is 58 in. The table is 54 in. wide by 16 ft. long, and accommodates six of the largest rods for edging or two for slabbing or channeling.

New features include a cross-rail down-feed that is entirely independent in amount and direction of the table feed, permitting the operator to select the proper down-feed without consideration of the amount of



*The Table Accommodates Six of the Largest Rods for Edging, or Two for Slabbing or Channeling*

longitudinal feed on the table. In addition to increase of the feed range, the new arrangement is stressed as of value in sinking the milling cutters into the work and in securing the proper radius on the rods. It also permits of simplification and centralization of controls at the operator's working position.

The cross-rail, an L-shaped casting, carries at its left-hand end the cutter spindle and quill, also the large worm-gear drive box. The cutters are driven by a 75-hp. motor mounted on a plate at floor level, the power being transmitted to the cutter spindle through a large worm and worm wheel, which are entirely inclosed and run in oil. The worm is of steel, hardened and ground in the threads, and is equipped with ball thrust bearings. The cross-rail is suspended by two screws which have ball thrusts at the top and are anchored at the bottom to prevent buckling by upward thrusts. It has rapid vertical movement by power and a wide range of automatic vertical feeds, also hand feed for fine adjustment by ratchet lever at the operator's end of the cross-rail. A scale is provided to enable the operator to set the rail to the correct height from table. On the cross-rail are two adjustable bearings, one to support the end of the mandrel, the other for an intermediate position. Adjustment for these bearings along the rail is by rack and ratchet.

Both the cross-rail feed and table feed are operated independently of the main driving motor, but the electric control equipment is arranged so that neither the table feed motor nor the cross-rail feed motor will run unless the driving motor is in operation. These motors are electrically interlocked so that failure of current to the driving motor either accidental or otherwise will disconnect both feed motors from the source of power. Means are provided however by which either or both of these motors may be thrown in momentarily for running the table by fast traverse or for elevating or lowering the cross-rail without operating the driving motor. This is accomplished by snap-out spring push buttons.

The table feed and traverse mechanism is operated

by a 10-hp. motor mounted on a gear box on the right-hand housing. Feed and traverse gears are entirely inclosed and run in oil. These gears connect with the main feed shaft under the table which transmits its power by a bronze spiral gear meshing with steel rack bolted to underside of table. Provision is made in the feed box by which the table may be securely locked in position. Table feeds range up to 12 in. per min., and traverse up to 20 ft. The cross-rail feed and traverse are obtained from a 5-hp. motor on the cross-tie, driving through an oil-tight gear box to the two elevating screws. Feeds up to 3 in. per min. and traverse up to 16 in. are available.

Attention has been given to ample lubrication of all moving parts of the machine and a cutting fluid attachment is provided. Fixtures for slabbing and channeling, as well as for edging, can be furnished.

### Device for Testing Compression and Elongation of Springs

A spring testing machine, known as the Elasticometer, designed for making compression and tension tests of springs, has been placed on the market by the Coats Machine Tool Co., Inc., 110 West Fortieth Street, New York. Compression springs ranging in length from  $\frac{1}{4}$  to  $8\frac{1}{2}$  in. and tension springs ranging from  $\frac{1}{4}$  to 8 in., can be tested by the device, which can be furnished for reading in pounds and inches, or in metric units.

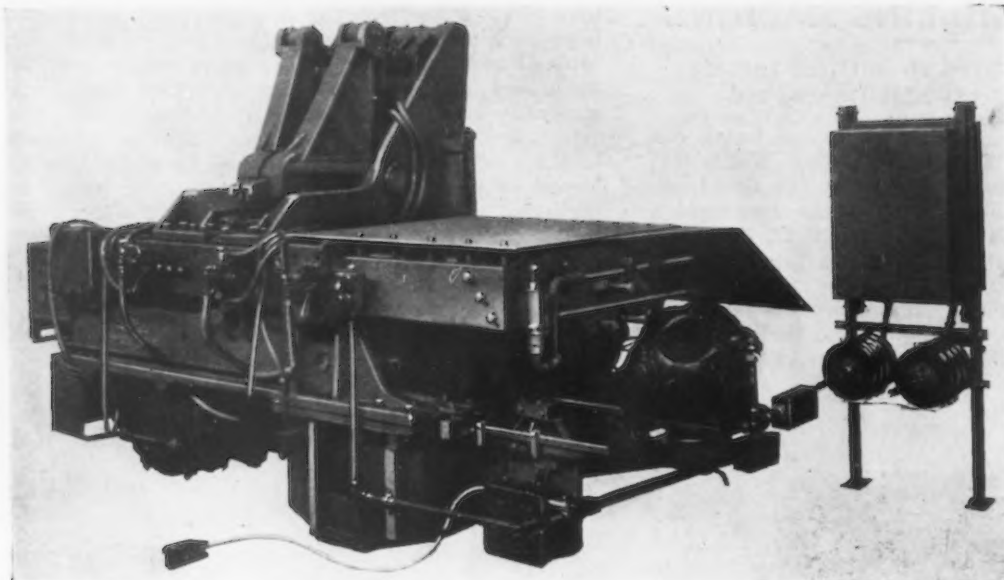
The device is essentially a precision beam balance with a ratio of 10 to 1. It is made up of three units—levers, connecting links and the main body. There are four levers, one each for compression, tension, weight and balancing, connected with one another through knife-edges and links. Linked to the compression lever is a fork carrying a sleeve having a square thread. A pressure transmitting spindle, consisting of three sections, which can be used conjointly or separately to accommodate the various lengths of springs, is screwed into the sleeve and used for testing compres-



*Compression Springs  $\frac{1}{4}$  to  $8\frac{1}{2}$  In. Long, and Tension Springs from  $\frac{1}{4}$  to 8 In. Can Be Tested*

sion springs. The transmission lever carries the weights used for the various tests. A holder with hooks for testing springs for elongation is attached to the tension lever at the top of the machine, and another corresponding hook is screwed on to the anvil.

The balancing lever carries a weight with screw-nut fine adjustment, on a horizontal beam to balance the scale before starting tests. An indicator to control this operation is suitably connected to the lever system. A double graduated scale mounted on the front of the body, in conjunction with a movable indicating bar, gives the result of the test for compression or elongation. The base of the machine measures 5 by 7 in. and the overall space required is  $7\frac{1}{2}$  by  $9\frac{1}{4}$  by  $16\frac{1}{2}$  in. The net weight is approximately 56 lb.



*After Air Clamping of the Work, the Pressing of the Motor-Starter Button or Foot Switch Causes a Complete Cycle of Operations*

### Rim Welding Machine Arranged for Automatic Operation

Air-operated clamps and an electrically-controlled mechanical push-up device for applying the final pressure are features of a heavy-duty production rim welder of the Federal Machine & Welder Co., Warren, Ohio. A 225 kw. flashproof welding transformer is employed on the machine, the welding capacity of which is for  $\frac{1}{2}$  x 18 in. rims.

Power for the movements of the machine is furnished by an electric motor as heretofore but clutches and clutch-operating mechanisms have been replaced by an automatically controlled motor. With this arrangement, after the work has been clamped by the air-actuated clamps, the pressing of a motor-starter button causes the machine to make a complete cycle of operations. The starting button may be operated by a foot switch. The type of motor used for this application is usually a three-phase induction motor.

To accommodate work of various sizes, arrangement has been made for varying the speed of the movable platen according to the nature of the work and also for varying at will the amount of the travel.

This has been accomplished by the use of direct-current adjustable-speed motors. A variation of 1 to 3 in speed is said to have proved sufficient in most instances. The motor is arranged to reverse its direction of rotation at the reversal of direction of travel of the push-up platen, the amount of travel of this platen being governed by the amount of rotation of the motor. The speeds of the forward and reverse strokes are governed by the field rheostats. The forward speed is according to the requirements of the work, the return of the platen to its starting point being at the highest speed.

It is claimed that in this manner a long duration of flash can be combined with a short or long travel of the platen or a short duration of flash can be combined at will with either a short or long travel of the platen, flashing off and pushing up a short or a long amount respectively. Tests are said to show that even 2 sec. variation in the time of flashing, one side or the other of the proper duration, will materially affect the quality of the weld. It is claimed that by pushing up the welding energy, by increasing the secondary welding voltage, the time required for making a good weld can be materially reduced, and production increased.

### Improves Portable Flange Facing Machine

E. J. Rooksby & Co., 1042 Ridge Avenue, Philadelphia, Pa., have recently put on the market an improved portable facing machine for use in locomotive repair



shops for refacing cylinder flanges and other pieces.

Formerly this type of machine was used only for refacing leaky ground joints, but since the welding and brazing of broken cylinder flanges has become common practice, the uses of the machine have increased. The illustration shows one of these machines set up in a locomotive cylinder, refacing the joint face. The four pads shown, each with two bolt holes, are for bolting four strips to the machine to hold it parallel to the cylinder flange while setting up the machine.

Reconstruction of the slide block and the addition of the adjustable tool holder, shown in the separate illustration, are outstanding of the recent improvements. This tool holder is of new design and incorporates the adjusting set screw, A, for setting out the cutter. The slide block of the previous machine had a tool bit in a square hole, while that of the new model has clamps and studs to hold the tool holder. A safety guard has been added to cover and protect the star wheel. The machines are made in five sizes to reface flanges from 18 in. to 45 in. in diameter.

*The Slide Block and Adjustable Tool Holder Is Shown at Right*





*Cotter-Ways and Keyseats in Locomotive Cross-Heads, Etc., Can Be Milled, as Well as Keyseats in Many Smaller Jobs*



### New Cotter and Keyseat Miller with Higher Speeds and Improved Collet

A new design of the No. 3 cotter and keyseat miller of the Niles Tool Works Co., Division of the Niles-Bement-Pond Co., 111 Broadway, New York, has been announced.

The machine was designed primarily for milling cotter ways and keyseats in locomotive crossheads, piston rods and axles, but can be adapted to many similar operations in railroad and general industrial shops. The higher spindle speeds and improved collet construction of the new machine are claimed to make it suitable also for milling keyseats in many smaller jobs found in locomotive shops, such as lift shafts, brake fulcrum shafts, valve stems, wrist pins, brake rigging pins, etc. The machine has a capacity for milling splines up to 36-in. long by 2½-in. wide by 16-in. deep. The chuck jaws will accommodate work up to 12 in. in diameter.

The bed is provided with a trough and pan for collecting the cutting fluid which drains into a receptacle from which it is pumped to cutting tools. The carriage has reversible longitudinal traverse on the bed and four different rates of feed, ranging approximately from 0.8 in. to 26 in. per min. are available. The carriage longitudinal feed is obtained by a screw placed centrally with the bed and is reversed automatically, by means of trips, at each end of the stroke. The stroke can be set to any desired length. Ball bearings

are provided at each end of the screw to take the thrust.

The two spindle heads mounted on the carriage have adjustment transversely with automatic feed in an inward direction toward the axis of the work. The spindle heads may be used independently or in unison, depending on whether single or opposite keyways are to be cut, or whether through slots are to be milled. The spindles are 4 in. in diameter and are arranged to receive No. 5 Morse taper sockets. These sockets are bored out for No. 4 Morse or No. 9 B. & S. split taper collets having a 7/16-in. hole for holding cotter drills.

Cross feed to the cutter spindles range from approximately 0.004 in. to 0.030 in., the feeding taking place at each end of the carriage stroke. An automatic stop is provided for use when two opposite drills are cutting through a slot, the stops serving to throw out one of the drills when the two drills are closely approaching each other at the center of the work.

The machine is regularly furnished with a pair of self-centering chuck jaws fixed for height and are adjustable longitudinally on the bed. The jaws are lined with hardened and ground steel plates and the chuck bodies are gibbed to their bases, provision being made for fine adjustment in all directions. Additional equipment can be furnished for special work.

The drive may be by belt, direct-current variable-speed motor or alternating-current constant-speed motor through a four-speed gear box. A 5-hp. motor is required.

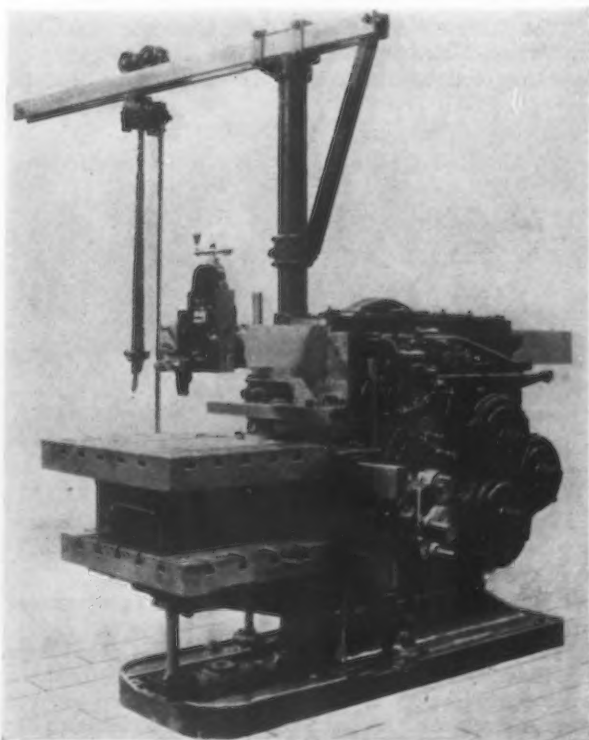
### 36-In. Stroke Heavy Duty Draw-Cut Shaper

The Morton Mfg. Co., Muskegon Heights, Mich., has announced a new 36-in. stroke draw-cut shaper, which is intended for short stroke heavy-duty shaping and planing.

The machine has vertical feed of 21 in. and horizontal feed of 48 in. on the crossrail. The crossrail can be extended in order to give 56 in. of horizontal feed if desired. All feeds are automatic and can be changed while the machine is in operation. The crossrail is raised and lowered by three adjustable screws. Provision for rapid change of feed, as well as deeper cuts and coarser feeds are features stressed by the makers.

The clutches and other important parts of the machine are automatically oiled and all bearings are of bronze. The cutting is done on the draw stroke, and an adjustable back bearing transfers the cutting strains to the column.

Either belt or motor drive arrangement can be furnished. The various attachments designed by the company for railroad work, except that for slotting driving boxes, can be used on the machine. Equipment includes adjustable back bearing, auxiliary table, large tee-slotted table, swivel base vise, jib crane with two-speed hoist, set of O.K. tools and holders. The same design of machine, with 48-in. stroke and with 56-in. horizontal feed of the crossrail, can be furnished.





## Electrically-Operated Transfer Car Takes Current from Cable

An electrically-operated ore transfer car, which is supplied with current through a cable, has been built by the Atlas Car & Mfg. Co., Cleveland, for the Perry Iron Co., Erie, Pa. The application of the cable was made because the track on which the car is operated could not be equipped with a trolley or a third rail. The cable is wound on a motor-driven reel which is mounted on the end platform of the car. The end of



*The Cable Is Wound on a Motor-Driven Reel Which Is Mounted on the End Platform*

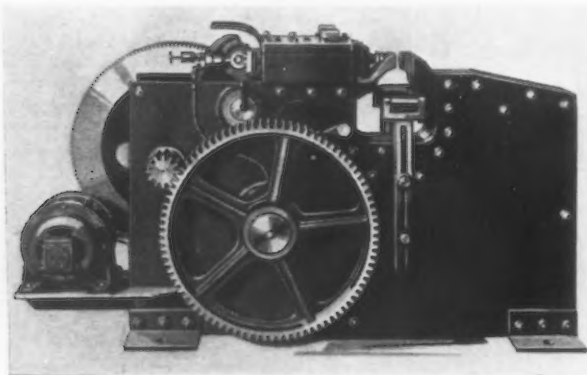
the cable has a plug attachment which is inserted into a receptacle at the end of the track.

The car is of the gable-bottom side-discharge type and discharges on both sides of the track simultaneously. The discharge gates are operated by compressed air. The operator's cab, located at one end, is arranged to extend beyond the side of the car so that the operator may have clear vision when running in either direction. The car is driven by two 60-hp. motors. The trucks are of the arch bar type, and the motors are mounted directly on the driving axle and are spring-suspended from the arch bar extensions.

The capacity of the car is 800 cu. ft. or 50 tons. of material. The length over couplers is 27 ft., the width overall 10 ft. 9 in., and the height to top of hopper, 10 ft. The track gage is 4 ft. 8½ in.

## New Horizontal Power Punch

The Buffalo Forge Co., Buffalo, is adding to its line an Armor-Plate horizontal punch, designed for the punching of flanged pieces, boiler heads, curved angles,



*Flanged Pieces, Curved Angles and Other Pieces May Be Punched Conveniently*

and other pieces which cannot be handled to advantage on the vertical type machine.

The arrangement of the machine may be noted from the illustration. All gears, as well as the flywheel, are mounted below the top of the machine to prevent interference with sections to be punched. The jaws are

designed to permit punching close to corners of angles; I-beams and channels in webs and flanges; and of H-sections in flanges. The semi-floating punch head employed is stressed as permitting lowering the punch for the accurate locating of centers. The punch is engaged by a foot trip.

A cast-steel rocker arm on a bronze-bushed king pin, which is stationary in the frame, operates the punch. The frame is reinforced at this point by welded disks. Wear of the ram is taken up by bronze-bushed eyebolts, this being a new feature of all of the company's machines. Gibs on the plunger provide for wear adjustments. Gears are machine cut from steel castings, and the pinions are steel forgings. All bearings are bronze-bushed and flywheel bearings are of the ring-oiling type. The frame is made up of two heavy plates.

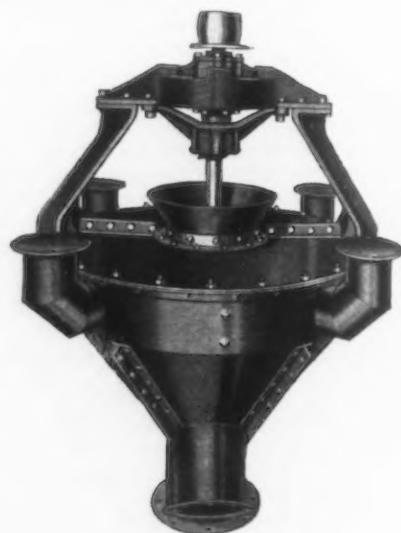
Four sizes of the punches are available. The depth of throat of the smallest size is 12 in. and of the others 16 in. Standard machines with throats of greater depth can be supplied. Specifications for the smallest and largest machines are as follows: Capacity, 1 x ⅝ and ⅞ x ¾; 2 x 1 and 1½ x 1¼, respectively; strokes per min., 38 and 25; height of stroke, 1 1/16 in. and 2 in.; hp. 3 and 10; length, 6 ft. 3 in., and 10 ft.; width, 2 ft. 3 in. and 4 ft.; height, 3 ft. 8 in. and 6 ft. 3 in., respectively. The weights are 3650 lb. and 14,000 lb., respectively.

## Screen Separator for Foundry Use

Removal of the dust and fines from foundry sand is the function of the machine here illustrated, which is obtainable from the National Engineering Co., 549 West Washington Boulevard, Chicago. This machine, designated as the Cyclone screen separator, breaks up the lumps and screens the sand in one operation.

Sand fed into the hopper at the top of the machine falls on a fan and is thrown outward by centrifugal

*Lumps Are Broken and the Sand Is Screened in One Operation. Tailings are removed through the refuse spout, and the fines through the four spouts at the top of the machine*



force against the inner face of a breaking ring. From the breaker ring, the air circulation screens the sand through a conical screen, the screened sand falling through the spout at the bottom of the machine. The tailings are removed through a refuse spout at the front of the machine. The action of the fan separates the dust and fines from the screened sand, these fines being removed through the four spouts at the top of the machine. The spouts can be connected to a dust collecting system.

The machine may be arranged for either belt or direct motor drive. The crossbeam and supports are of steel castings. Timken bearings are used for both upper and lower bearings on the fan shaft. The screen is arranged for convenient replacement.

The annual summer outing of the Pittsburgh Foundrymen's Association will be held Monday afternoon and evening, June 20, at Turner Park, Perrysville, Pa.

# Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

## Statistical Data Concerning the Chief Consuming Industries Indicate That:

1. Steel ingot production, dropping in April, is in good adjustment with potential composite steel demand.

2. Trend in chief consuming industries appears to foreshadow a moderate recession.

3. Railroad traffic has shown a decline and revenues have ceased to expand.

4. Car orders in May were better and locomotive orders were higher than for any preceding May in years.

5. Structural steel sales, while large in April, may reflect in May the diminishing scale of building activity.

6. Automobile production is irregular, and a highly competitive condition is disclosed. Output for year will be probably 10 per cent under 1926.

7. General manufacturing activity, outside of steel and automotive industries, is remarkably well maintained.

8. Oil production and mining activity, which earlier were supporting the steel business, are in a depression; oil probably will not recover before fall.

9. Farm purchasing power continues unsatisfactory; farm machinery demand is fair but that for wire is unsatisfactory.

**D**EMAND for iron and steel is on the whole dull and declining slightly. The hope on the part of consumers for lower prices, backed by continued weakness in the scrap market, is tending to reduce buying at present—a situation that appears to be world wide.

The composite demand curve for iron and steel, based on the activity of the chief consuming industries, declined in April and reached the lowest point since January. The April level was a little below the average of the last year and a half. The preliminary index, 115, compares with 121 in March,\* and is almost exactly the same as that for April, 1926, in which month, also, the trend was downward. This means that in April the requirements and potential demand for iron and steel fell off rather sharply.

The ingot output (adjusted), however, declined in April, also, and the point is worth making that *the production of steel was in good adjustment with the potential demand*. The tendency of buyers to postpone purchases has been pronounced and actual buying of steel has probably fallen more than the activity of the consuming industries indicates. But the moderate level of production, in comparison with indicated require-

ments, is encouraging. It should mean that the stocks in the producers' hands, as well as those held by consumers, are moderate, and that more active buying will be in order within a few months.

### What Caused the Decline

The April drop in our demand curve was due to considerable declines in railroad freight traffic, building activity, automobile production, and the output of mines and oil wells. Declines in these directions were partly offset by exports, by improvement in agricultural purchasing power, and by well sustained general manufacturing activity and machine tool business.

As to the future, it can hardly be doubted that the trend of demand for iron and steel will continue moderately downward during the next two or three months. Perhaps the reasons for this conclusion will be more apparent when we examine the condition in each of the leading consuming industries, as in the following paragraphs.

(1) *Railroads.* The trend of railroad car loadings is distinctly less on the up-grade than was the case last year, and the weekly loadings figures have already run behind those of a year ago, on at least three occasions. This has been true not only of coal but of less-than-carload and merchandise freight. Our adjusted April

\*Corresponding respectively with 1.14 and 1.50 units of standard deviation, as shown in Fig. 1.

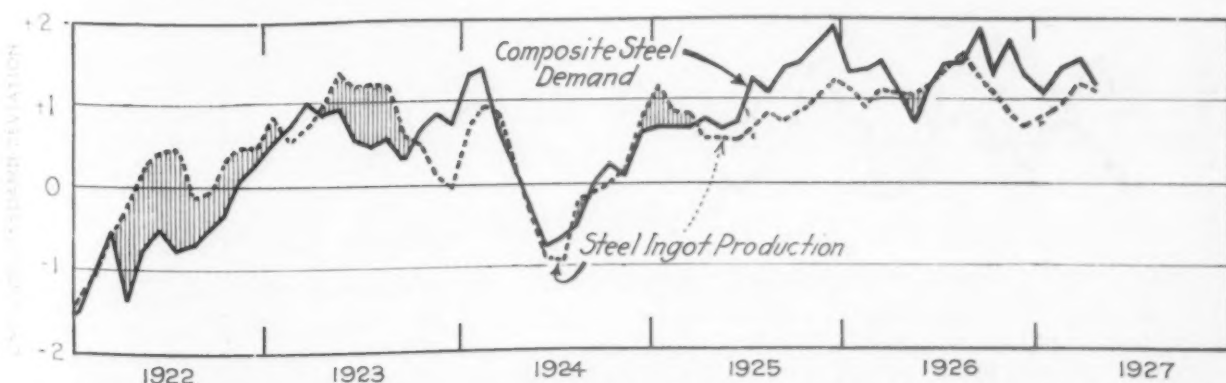


Fig. 1—Steel Ingot Production, Adjusted for Seasonal Variations, Is in Fair Adjustment with Demand. A little less activity is indicated for the months ahead

index of freight tonnage was 118.4 against 123 in the preceding month. Moreover, the April earnings statements of the railroads indicate that gross revenues have ceased to expand and that net operating income is running considerably behind a year ago. Under the circumstances, it seems logical to conclude that railroad buying will be somewhat below normal and the equipment markets promise to continue irregular and generally dull.

(2) *Building.* Construction activity, making allowance for seasonal conditions, declined rather sharply in April, this being true of permits, contemplated new construction and floor space in new contracts. The general level thus far this year has been materially lower than in the same period last year and April contracts on a floor-space basis were smaller than in April, 1925. There continues to be every indication of a gradual and irregular decline during most of the remainder of the year. Structural steel orders are in fair volume, but competition and price shading indicate that the demand is considerably below capacity.

(3) *Automobiles.* Production of motor vehicles was a little smaller in April than in March and further curtailment will probably be reported for May. The April decline was small, but normally there is a good increase in the fourth month, and this fact makes any decline more significant. The volume of production and sales of several medium and low-priced cars are large, but the business is not evenly distributed, and the production of high-cost cars has declined. Several accessory manufacturers are not doing well. Earnings of the Pierce Arrow, Dodge and Hupmobile companies during the first quarter were much below those of a year ago. On the whole, the automobile business during 1927 is practically certain to be considerably less than in 1926, perhaps by more than 10 per cent.

(4) *Manufacturing.* General manufacturing activity declined only a little in April, making allowance for seasonal variations. In general, it was remarkably well maintained and should continue to furnish a good general demand for miscellaneous iron and steel products. The machine tool business shows a somewhat more encouraging trend. April orders were only about the same as in March, but, as there is usually a decline in April, our adjusted index shows a good gain. Current reports indicate that the May business has been fully as good as in April and the outlook for the future appears to be fair.

(5) *Mining.* Considering the season, the production of copper and of anthracite coal was large, but the bituminous coal strike and over-production in oil caused recession in those lines which more than offset the other gains. It is encouraging to note that the Government reports show the April oil production to

have been below March. Usually there is a seasonal decline in April, but the decline this year was even larger than the normal variation due to seasonal conditions, our adjusted index being 135 against 138 in March. Drilling activity has been materially curtailed. For the present these developments mean a reduced demand for steel. The industry is not likely to recover from its present depression before fall at the earliest.

(6) *Exports.* At 192,339 tons, the exports of iron and steel in April showed more than the usual seasonal gain and were at the same fair annual rate as obtained in January. The tonnage, however, consisted largely of scrap and tubular goods. Moreover, the prices and profits applying on this export business would perhaps make another story. We continue of the opinion that the outlook for exports is not favorable. Conditions in Canada, our largest foreign purchaser, are good; but the reverse is true in Japan, and it is difficult to see how competition from European producers can fail to be severe.

(7) *Agriculture.* Conditions in the farming world are mixed. The gross income of the chief crop producers is low, but, thanks to better prices, is a little above a year ago. *Agricultural prices have recently advanced and have gained on the price level of manufactured goods, so that the purchasing power of the farm dollar is distinctly greater than it was at the beginning of the year.* To a considerable extent, however, the price situation is due to the outlook for crop reduction and no one can now foresee the net outcome. It may be said that there is a fair chance that farm prices may rise sufficiently to offset the prospective shortage of the crops. Current reports indicate a fair demand for steel from agricultural machinery manufacturers, but the demand for wire is unsatisfactory and this is reflected in increased mill stocks and weakness in wire bar prices.

### Building Activity Clearly Lower

CLEAR evidence of the relatively low level to which building activity has fallen is the outstanding fact illustrated by Fig. 2. Considering the season, building in April reached the lowest point since March, 1925. This statement is based on the floor space in new contracts reported by the F. W. Dodge Corporation, which figures are most significant as to the quantity of steel required. Our adjusted index for April was 113.3, against 127.2 in March and 117.3 a year ago.

April bookings of structural steel showed a rise such as is common in that month. (It will be noted that the structural steel curve is not adjusted for seasonal variation.) More than this, the bookings were larger than in April, 1925, or in April, 1926, being 241,680 tons against 237,880 tons and 222,600 tons, re-

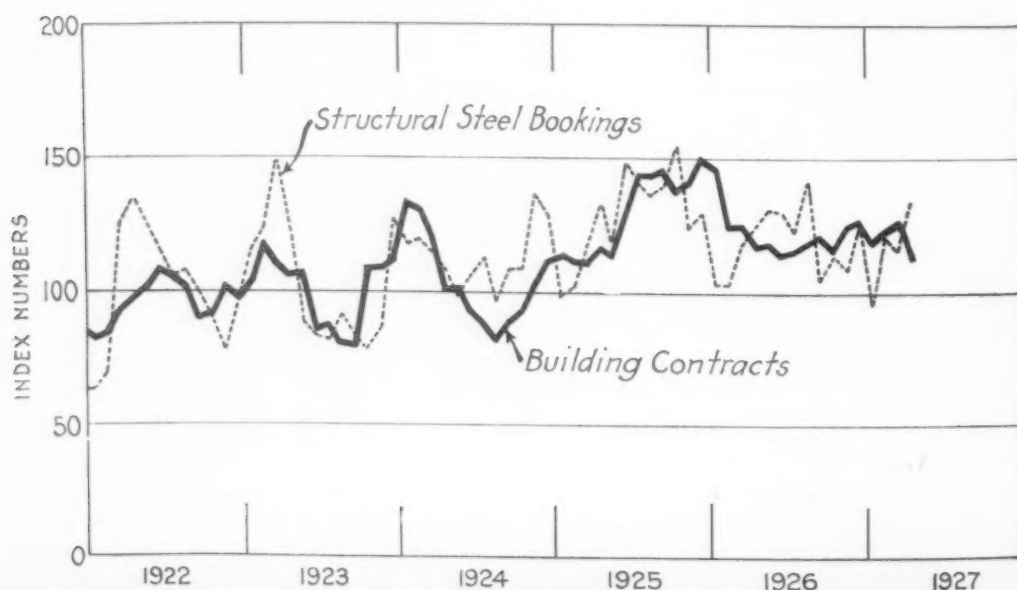


Fig. 2—Structural Steel Bookings, While of Good Volume in April, Have Shown a Lower Level Through May. Building contracts show a reversal of the previous upward movement. Fabricated structural steel is likely to be in only fair demand for some time



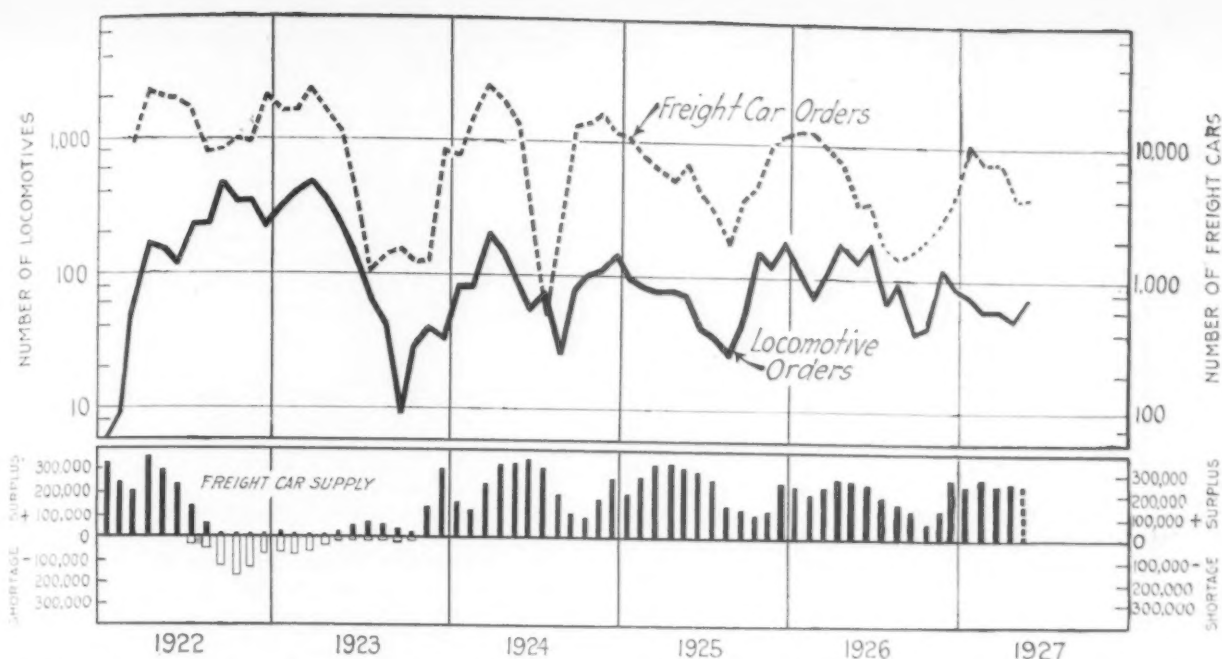


Fig. 3—Locomotive Orders in May Recorded the Best May in Many Years. Freight car orders were moderately good. Both curves are plotted as a 3-month moving average

spectively. The average weekly rate reported currently was 42,750 tons. Prospects are for a lower figure covering May bookings, the average weekly trade reports indicating only 30,875 tons, which suggests that the total for the month may be less than 200,000 tons. This would be the lowest May figure since 1924. A dip in May, however, is not uncommon.

In our opinion, building activity will furnish only a fair source of demand for iron and steel during the remainder of the year. Money promises to hold fairly easy, but not sufficiently so to stimulate any large activity, particularly in view of the attitude of the banks toward real estate mortgages. The tendency in financial circles is to discourage such issues. It is hard to see how this could be otherwise. Many industries at present have a greater capacity than required, and there is certainly no general housing shortage. Building costs are high, particularly the labor item. The trend of residential rents continues downward and real estate activity is on the decline.

#### Some Recovery in Railroad Rolling Stock

RAILROAD equipment orders show a recovery in the number of locomotives bought in May, and a fair volume of freight car business. *Railway Age* reports May orders for locomotives, at 184, which compares with 27 in April and 50 a year ago. This is the largest number for the month of May in a good many years. Freight car orders in May are reported at 4378, against 3362 in the preceding month and only 435 in May, 1926. In May, 1925, however, there were 8944 freight cars ordered. The May freight car business is moderately encouraging, but it remains to be seen whether or not it was only a temporary spurt.

The first four months of the year taken together have certainly not been encouraging. The American Railway Association reports that through April the railroads placed in service only 20,066 freight cars, or 9914 fewer than in the same period last year. Also,

in the case of locomotives, only 634 were placed in service down to May 1, against 759 last year. On May 1, there were only 217 locomotives on order in comparison with 654 at the same date in 1926. The number of freight cars on order was only 26,675 against 48,762 last year. Thus the improvement in May goes but a little way toward relieving a moderately unfavorable condition.

#### Less Rolling Equipment Added by Railroads

The railroads of the United States in the first four months in 1927 installed 22,066 freight cars in service, according to reports filed with the car service division of the American Railway Association. This was a decrease of 9914 cars compared with the number placed in service during the corresponding period in 1926, while it also was a decrease of 35,860 cars compared with the number installed during the corresponding period in 1925.

The railroads on May 1 this year had 26,675 freight cars on order compared with 48,762 on the same date last year and 43,301 on the same date in 1925.

Locomotives placed in service in the first four months of 1927 totaled 634, of which 187 were installed in April. In the first four months last year, the railroads placed in service 759 locomotives, and in the corresponding period in 1925, 601 were installed. Locomotives on order on May 1 this year numbered 217, compared with 654 on May 1 last year and 340 on the same date two years ago.

Average weekly earnings in New York State factories are reported by the State Industrial Commissioner to have been \$29.17 in April. Except for November, this is the lowest figure since August, 1926. It is, however, higher than any figure preceding August. There was a drop of more than 2 per cent from the \$29.78 of March, which was the highest figure ever recorded.

Schedule of the next installments of the *Business Analysis and Forecast*, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows: **June 16**—Position of Iron and Steel Producers; **June 23**—General Business Outlook; **July 14**—Activity in Steel Consuming Industries.

## American Boiler Manufacturers Focus on Trade Extension

Trade extension was the outstanding topic discussed by the American Boiler Manufacturers' Association at its thirty-ninth annual convention at French Lick Springs Hotel, French Lick, Ind., May 30 to June 1, with an attendance of about seventy-five. Five committees were appointed to cover trade extension work for the five groups of boilers manufactured by this industry. Each committee will operate independently, but it is the intention at the next meeting to appoint a group chairman for the five committees.

This action on trade extension work followed an interesting talk on marketing of products by E. St. Elmo Lewis. Another phase of this same subject was brought out in an address by W. H. Rastall, Department of Commerce, Washington, who discussed "Possibilities of Boiler Export Business" and expressed the belief that American boiler manufacturers could develop a good foreign market. A committee was appointed to make a survey of the export field.

Starr H. Barnum, the Bigelow Co., New Haven, Conn., was elected president for the ensuing year, succeeding George W. Bach, Union Iron Works, Erie, Pa. M. F. Moore, Kewanee Boiler Co., Kewanee, Ill., was elected vice-president and A. C. Baker, 801 Rockefeller Building, Cleveland, was re-elected secretary and treasurer. New members of the executive committee are George W. Bach; A. C. Weigel, Walsh & Weidner Boiler Co., Chattanooga, Tenn.; H. E. Aldrich, Wickes Boiler Co., Saginaw, Mich., and J. R. Collette, Pacific Steel Boiler Corporation, Waukegan, Ill.

The next meeting will be held in Cleveland, Feb. 7, 1928.

## Supply Associations Arrange Convention Programs

An open discussion on making the distribution of mill supplies more profitable will be a feature of the twenty-second annual convention of the National Supply and Machinery Distributors' Association to be held on board the steamship Noronic which will leave Detroit on Monday, June 13, returning there Friday, June 17. All sessions of the convention will be held on board the boat. The Southern Supply and Machinery Distributors' Association and the American Supply and Machinery Manufacturers' Association will meet jointly with the National Supply and Machinery Distributors' Association. "Modern Merchandising" will be the subject of one of the convention addresses, to be delivered by William L. Goodwin of Goodwin, Nicholas & Morton, Inc., New York. There will be a report on overhead expenses in distributing mill supplies; a discussion of business conditions throughout the country, and discussions as to how the manufacturer can assist the distributor, how the distributor can render better service to the manufacturer and how the distributor can obtain greater recognition from the consumer. A discussion as to methods of eliminating unprofitable lines is also scheduled.

## Steel Treating Initiates Their 35th Chapter

The thirty-fifth chapter of the American Society for Steel Treating and the fifth to be organized during the administration of Pres. J. Fletcher Harper, was started in the Canton-Massillon district on Thursday, May 26. A number of preliminary meetings and work had taken place previous to this meeting, so that 150 members and guests had dinner at the Canton Club.

President Harper presented a charter to the new group while the principal address of the evening was given by Dr. Zay Jeffries on the subject: "Metals of Industry." Doctor Jeffries presented a survey of the metallurgical problems facing various manufacturing industries, pointing out in particular those of the lamp industry and those involved in the development of the aeroplane used by Captain Lindbergh. Past-president W. S. Bidle, and Secretary W. H. Eisenman also addressed the meeting.

The Canton-Massillon chapter established a new record by having a total membership of 121 on the

night of its opening meeting. The following officers of the chapter have been elected: Chairman, Martin H. Schmid, Central Alloy Steel Corporation, Massillon; vice-chairman, Earl W. Hanna, American Sheet & Tin Plate Co., Canton; secretary-treasurer, Robert Sergeant, Central Alloy Steel Corporation, Canton; executive committee: E. C. Smith, Central Alloy Steel Corporation, Canton; Floyd Dore, American Steel Foundries, Alliance; L. D. Cable and T. W. Hardy, Timken Rolling Bearing Co., Canton; C. E. Nordfeld, Massillon Steel Castings Co., Massillon; D. D. Reed, E. F. Houghton & Co., Canton; Paul M. Snyder and W. M. Lindsey, Central Alloy Steel Corp., Massillon.

## Develops Copper Steel Doors for Airplane Hangars

To meet a demand occasioned by the growing use of airplanes and the consequent increase in hangar requirements, the Truscon Steel Co., Youngstown, has developed and already has made several installations of a copper steel hangar door. It represents a new use of steel and makes its contribution to the list of uses about which little is said and which account largely for the maintenance of steel production in the face of decreases in the use of steel in some of the older fields.

The Truscon door operates on a track imbedded in the floor and its weight is carried on the rail rather than by the roof. The doors run to the side of the hangar and occupy so little space that no interference with the machines entering or leaving is possible. The door frame is of tubular steel, having panels of No. 12 gage steel fitted to the outside rail to give a plane smooth surface and to prevent openings or recesses which might collect water and cause corrosion. The doors run on cast steel wheels mounted in a cast steel housing, with swivel and ball-bearings on a vertical shaft, and lubrication is provided. Steel rollers attached to the head of the doors run along overhead guide tracks with a minimum of friction. Stiles and rails are built of hot-drawn seamless copper alloy steel tubing mitered and internally reinforced at the corners, the reinforcing members extending 12 in. in each direction. Dovetail miter joints at the sash muntin intersection lend rigidity to the door and the small muntin bars offer minimum obstruction to the passage of light.

## Rods in Straight Lengths to Take Same Rates as Coils

WASHINGTON, June 7.—Carload rates on steel rods in straight lengths should be the same as those on the same commodity when in coils, the Interstate Commerce Commission held in a decision last week. It passed upon the issue in connection with a complaint made by the Standard Nut & Bolt Co., Valley Falls and Pawtucket, R. I., and affirmed previous decisions that the rates on rods in straight lengths should be no higher than those on rods when shipped in coils. The commission specifically held that the rates on steel rods in straight lengths from Pittsburgh and Johnstown, Pa., and Buffalo and North Tonawanda, N. Y., to Valley Falls and Pawtucket are not unreasonable but are unjustly discriminatory and unduly prejudicial to the extent that they exceed rates on the same commodity when shipped in coils, and ordered that the same rates be applied on the rods in both forms on or before Aug. 10.

## Standards for Billet Steel

WASHINGTON, June 6.—The National Committee on Metals Utilization, Department of Commerce, has sent out a report on the meeting of March 19, when the intermediate grade of new billet steel was adopted as the standard for concrete reinforcement. The report has been distributed among consumers, producers and others for their approval, preparatory to publication of a bulletin in the "Elimination of Waste" series. Such publication is dependent upon formal acceptance of 80 per cent of each of the groups.

# Handling Tin Plate for Export

*Proper Packing  
Essential to  
Protect Metal*



*Gripping Device  
Reduces Risk of  
Damaging Boxes*

BY THOMAS E. LYONS\*

**D**URING 1926 exports of tin plate from the United States amounted to 250,782 gross tons. This figure almost doubled the 1925 exports of 161,382 tons. The value of the 1925 exports amounted to \$18,587,000, or an average of \$115 a ton. The 1926 value is not available, but computed on the 1925 average ton price it approximates \$30,000,000. The following table shows the leading countries to which tin plate was exported for both 1925 and 1926:

## UNITED STATES EXPORTS OF TIN PLATE

(In Gross Tons)		
Country of Destination	1925	1926
Japan, including Chosen.....	38,775	49,064
Canada .....	32,753	46,954
China .....	19,388	24,179
British India .....	9,471	14,594
Argentina .....	7,689	16,574
Italy .....	7,527	10,125
All others .....	45,780	89,292
Total .....	161,383	250,782

### Tin Plate Boxes Should Have Water-Tight Lining

The proper packing of tin plate for export has been the subject of a great deal of discussion. Not long ago the American purchasing agent for a large meat-packing establishment in South America wrote that many complaints were received on the poor condition

of tin plate deliveries. This agent recommended that all tin plate should be shipped in tin-lined cases, asserting that the thin material substituted for tin lining was not sufficient to prevent damage in shipment.

Tin plate is customarily packed in wooden boxes containing 56, 112 or 224 sheets. If the plates are likely to come in contact with water or severe dampness they should be packed in a tightly soldered envelope inside the wooden box. Thus packed, the sheets are protected against moisture and may be safely stored. Most exporters make an additional charge for these tin-lined cases, based on the actual cost of material and labor. The accompanying photograph shows the method employed by a successful exporter in preparing his products for export. This concern has been exporting tin plate for many years; it states that shipments packed in this manner always arrive in good condition.

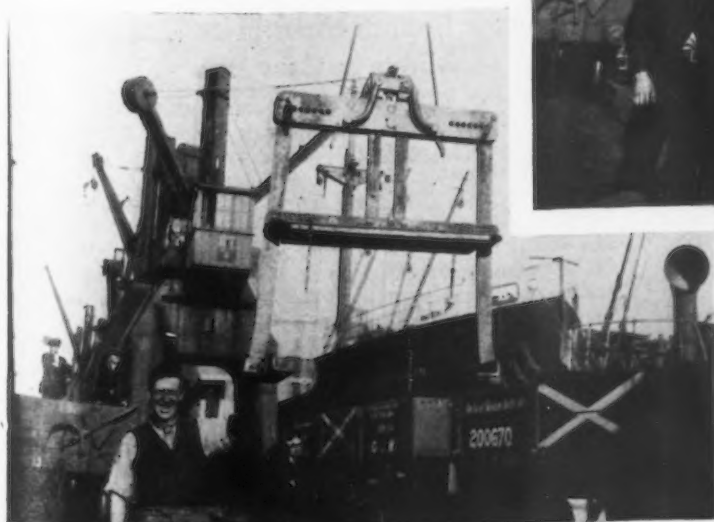
The packing case shown in the illustrations has 7/8-in. ends and sides. The top and bottom are of 3/4-in. lumber, the grain of the wood running the shorter dimensions. This construction gives maximum resistance to breakage when a chain or rope sling is placed around the girth of the box.

Each box is reinforced with four No. 12 gage galvanized wires, running laterally with each side and end. The wire is applied under tension and cuts into the corners of the box enough to prevent slipping.

\*Transportation Division, Department of Commerce, Washington.

*In the Illustration at the Top of the Page Is an Export Box Before It Has Been Closed and Strapped. To protect the tin plate, the sheets are enveloped in an air-tight lining of No. 30 gage tin*

*Below—The Grip Used for Handling Boxes of Tin Plate Is Shown Without a Load*



*"Scott's Grip," as the New Loading Device Is Known, Was Patented by Cowling & Scott, Engineers, Stafford Road, Newport, Mon., England, According to the Department of Commerce. The grips are made at their Newport works at a cost of £31 10s. each, the equivalent of \$152.78 at the current exchange rate of \$4.85 per £*



The ends of the wire are twisted into a seal by the same operation which applies the tension.

#### New Handling Device Developed by British

In order to overcome packing difficulties and permit the use of thinner material in boxes, British shippers of tin plate have recently developed a new method of handling. It is a recognized fact that most damage to tin plate containers is caused by chain slings. A shipping company at Swansea, Wales, has adopted a device which, it is claimed, prevents any damage to containers at the time of loading. The Great Western Railway has 24 of these devices in operation on its tin plate loading wharves at the Swansea docks. J. C. Watson, American consul at Swansea, states that severe tests prove this loading device very efficacious. The Swansea docks have used a similar device for loading black plates and galvanized sheets for a year with apparent satisfaction, he says.

The old method of loading tin plate with a chain sling always involves the risk of crushing; it puts the

entire weight of load on the sides of the top and bottom boxes.

With the new method, a patented grip is used. The boxes are held perfectly level and the side arms of the grip are drawn in tightly and held firmly by the pins, which are self-locking, at tops and sides. The photograph shows how the locking levers on the top arm of the grip engage in the teeth of the two center bars.

The grip is also used for loading black plates and sheets. Longer bases are required to support the longer sheets. Officials in charge at tin plate docks stated that the men could load 10 per cent more quickly with the new grip. It was further stated that tests proved this grip absolutely foolproof; the boxes remained secure after the grip was allowed to swing heavily against the side of the ship.

Inasmuch as unloading involves the same risk of damage as in loading, any device of this nature should be part of the ship's equipment, rather than a facility of the port. The carrier can then give cargo the same careful handling and thereby eliminate any chance of damage from handling in rope or chain slings.

## DISCUSS EMPLOYEE PAPERS

### Company Publications a Large Factor in Maintaining the Personal Element in Industry

A main purpose of employee publications is to make industry or business more human and to take the place of the personal relations that once existed between employer and employee. This was the outstanding thought expressed by Charles T. Miley, supervisor department of public service, Carpenter Steel Co., Reading, Pa., in a paper read before a conference on employee magazines, held on June 3 in New York under auspices of the Policyholders' Service Bureau, Metropolitan Life Insurance Co. The Carpenter company's publication, which had been the outcome of personal letters by the vice-president in charge of production to 400 employees in Government service during the World War, had grown steadily to a position of real importance in the affairs of the company.

"The employee magazine," the paper went on to say, "helps to give the workman a knowledge of his job. It can carry a great deal of information that will create in the mind of the man not already employed a desire to work at a particular job and some understanding in advance of what that job means and how it is done. It can so inform your employees at large that when a man is transferred from one department to another, he goes to his new work with ready-made appreciation of what he is expected to do. It can and does serve as a means of educating those, who have been working at a job for years, in the most advanced and approved practices that have been recently developed, and it can serve to transmit from a man who has improved on the way of doing his work, his idea to another man in the same line of work."

The function of the employee magazine as a "straight out and out sales proposition" was suggested by Earl Morgan, manager employment and service department, Curtis Publishing Co., Philadelphia. "The job of the house organ," he said, "is to sell the institution to the employee and the employee to the institution." Mr. Morgan stressed the necessity of securing a competent editor, a man who would give his entire time to the work. "Define this editor's policies," said the speaker, "and then let him go to it. Make him responsible and do not interfere with him in any way so long as he obtains results."

"There is no such thing," Mr. Morgan continued, "as having to talk or write down to employees. Have something to say, and then say it in the most interesting and natural way and they will get it." He emphasized the value of the picture in the shop magazine, and of photographs and stories designed to inculcate pride in an employee's job.

Dr. Lee Galloway, vice-president Ronald Press Co., New York, speaking on "Trends in Modern Education," said: "The plant magazine stands at the center of a series of concentric circles—the factory, the home and

the community at large. This is a position of great strategic importance, for business is the one great unifying element in the patchwork of our national life, and an employee may become an important factor in counter-balancing those disintegrating influences which the surge of immigration has produced by forcing upon us a mottled national array of races, nationalities, cultures and provincialisms."

It is probable that similar conferences will be held in the future at stated intervals and a committee will prepare a program of activities in which the Metropolitan company has promised cooperation.

### Entertain President of International Management Congress

Dr. Francesco Mauro, Milan, Italy, president of the International Congress of Scientific Management, was the guest of honor at a luncheon given by a number of American engineers at the Engineers Club, New York, June 3. Robert T. Kent, general manager Bridgeport Brass Co., Bridgeport, and chairman of the committee on American Participation in International Management Congress, presided at the luncheon.

In addition to Doctor Mauro, brief addresses were made by Dr. H. S. Person, managing director of the Taylor Society, and by Joseph W. Roe, professor of industrial engineering, New York University. The addresses of all speakers centered on the third international management conference which is to be held in Rome, Italy, Sept. 5 to 8, as announced in THE IRON AGE of June 2, page 1615. Doctor Mauro plans to remain in the United States for a month during which he will visit industrial plants in several cities.

### Newark Foundrymen Hear Talk on Alloys in Cast Iron

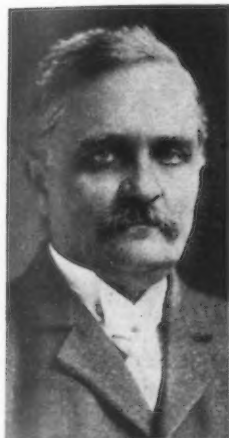
The use of nickel and chromium in gray iron castings was explained to the Newark Foundrymen's Association at its meeting Wednesday evening, June 1, by D. M. Houston, foundry engineer with the International Nickel Co., New York. Mr. Houston's talk followed that which he has delivered at other meetings. He explained how the control of combined carbon can be accomplished by the use of nickel in a properly adjusted base composition. He said that nickel is a carbide destroyer and a matrix hardener, thereby extending the limitations of the metallurgist in controlling chill without materially decreasing machinability or opening the grain structure of the metal. The importance of using the proper amount of nickel was emphasized, experiments having shown, he asserted, that a practical formula is two of nickel—one of silicon. With the use of nickel, the speaker said, it is possible to use ordinary and low-priced materials successfully.

## MECHANICAL ENGINEERS MEET

### Alexander Dow for Next President—Wilfred Lewis Honored—Steel Division Planned

ALTHOUGH recreational activities, including golf, tennis and a water carnival, were an outstanding feature of the spring meeting of the American Society of Mechanical Engineers, which was held at the Greenbrier Hotel, White Sulphur Springs, W. Va., May 23 to 26, technical sessions and meetings of the various committees had their usual prominent place on the program.

At a meeting of the council of the society, held



WILFRED LEWIS



ALEXANDER DOW

May 23, the formation of an iron and steel professional division was authorized. The next step is the appointment of a special committee, the personnel of which will be announced in the near future. A new publication policy was also approved by the council, and at the business meeting of the society, held the same day, the adoption of the new policy was voted.

Loughnan Pendred, editor of *The Engineer*, London, England, was the chief speaker at the formal dinner held May 24, at which Charles M. Schwab, president of the society, presided. The occasion was also marked by the presentation of the A.S.M.E. gold medal, the highest honor in the gift of the society, to Wilfred Lewis, president of the Tabor Mfg. Co., Philadelphia,

### Coal Washing and Coke Testing

The spring meeting of the Eastern States Blast Furnace and Coke Oven Association, held Friday, June 3, at the Longue Vue Country Club, Penn Township, Pa., near Pittsburgh, was featured by a paper, "Some Factors of Coal Washing," by J. R. Campbell, bituminous representative American Rheolaveur Corporation, New York; a report of the coke testing committee by its chairman, William A. Haven, superintendent of northern blast furnaces Republic Iron & Steel Co., Youngstown, Ohio, and the election of new officers for the coming year. Charles A. Meissner, superintendent by-product coke department, Weirton Steel Co., Weirton, W. Va., is the new president, Benjamin W. Winship, superintendent of coke plant, Bethlehem Steel Co., Steelton, Pa., vice-president, and William A. Haven, secretary-treasurer. Use of the clubhouse and the greens was open to members of the association and many played golf during the day.

Mr. Haven in reviewing the activities of the coke testing committee told of efforts that had been made in trying to interest other associations in standardization and in virtual failure to achieve definite results, except through the American Society for Testing Materials, which through a subcommittee of Committee D-5, had formulated and tentatively adopted standards of chemical analysis, porosity, shatter, size and tumble tests, which would have one year's trial prior to final adoption. While expressing appreciation of the cooperation that the committee had from the blast furnace and coke oven operators, Mr. Haven said the gathering

in recognition of his contributions to the science of gear design. The presentation speech was made by Conrad Lauer, Philadelphia, and the Engineering Foundation was represented by George A. Orrok. Mr. Lewis, whose formula for the strength of gear teeth is extensively used today, began his work on gear teeth more than 40 years ago. His first technical paper before the society, under the title of "Experiments on the Transmission of Power by Gearing," was presented in 1886. Mr. Lewis also recently received the Edward Longstreth medal of the Franklin Institute for his development of a shockless jarring molding machine.

Three papers were presented at a session under the auspices of the machine shop practice division. These were: "Vibration of Frames of Electrical Machines," by J. P. Den Hartog; "Arc Welding," by J. F. Lincoln, president of the Lincoln Electric Co., Cleveland; and "Hysteresis Relative to the Operation of Mechanical Springs," by J. K. Wood, consulting engineer, New York. Other sessions were devoted to education and training for the industries; management; materials handling; fuels; oil and gas power; central station power; and railroads.

### Officers for Next Year

Nominations for officers of the society for terms beginning in December were announced at a meeting of the nominating committee. The nominees are:

**President:** Alexander Dow, president Detroit Edison Co., Detroit, Mich.

**Vice-Presidents:** John H. Lawrence, vice-president and engineering manager Thomas E. Murray, Inc., New York; Newell Sanders, Newell Sanders Plow Co., Chattanooga, Tenn.; Edward A. Muller, vice-president and general manager King Machine Tool Co., Cincinnati, and Paul Wright, Paul Wright & Co., Birmingham.

**Managers:** William A. Hanley, chief engineer Eli Lilly & Co., Indianapolis; Luther B. McMillan, chief engineer Johns-Manville, Inc., New York, and Fred H. Dorner, Milwaukee.

**Delegates to the American Engineering Council:** Alexander Dow, Detroit; D. S. Kimball, Ithaca, N. Y.; R. C. Marshall, Washington; L. P. Alford, New York; H. V. Coes, Chicago; W. S. Lee, Charlotte, N. C.; A. M. Greene, Jr., Princeton, N. J.; David W. Brunton, Denver; and John L. Harrington, Kansas City.

Pittsburgh has been selected for the 1928 spring meeting of the society.

of the data was something that should be done by a paid secretary. Mr. Russell, Youngstown Sheet & Tube Co., F. W. Sperr, Jr., Koppers Co., Pittsburgh, and J. W. Hacker, Central Furnace Co., Massillon, Ohio, discussed the report, Mr. Hacker stressing the need of a standard mode of testing coke that will not involve the use of the blast furnace and one which will not vary, claiming that the results would be of little value if tests were made by one method at one plant and by another at others.

There was common acceptance of the principle brought out in the paper by Mr. Campbell that washed coal produced a better metallurgical coal.

### Steel Fabricators Organize in Seattle

Seattle steel fabricators have incorporated what is to be known as the Northwest Structural Steel Board of Trade, its stated purposes being to promote the use of steel, create more interest in the use of structural steel in the Northwest and to correct and reform existing abuses in the industry. The new corporation will become the Northwest chapter of the American Institute of Steel Construction. Officials of the new interest are: J. F. Duthie, Wallace Bridge & Structural Steel Co., president; Cecil H. Bacon, Bacon & Matheson Forge Co., secretary, and Lacy Hofius, Hofius Steel & Equipment Co., vice-president. The incorporators are the Wallace Bridge & Structural Steel Co., Pacific Car & Foundry Co., Hofius Steel & Equipment Co., Isaacson Iron Works and Bacon & Matheson Forge Co.



## TO DIRECT RESEARCH WORK

### Professor Johnston Heads Steel Corporation's Newly Created Department

Dr. John Johnston, professor of chemistry at Yale University, has been chosen director of the recently established Department of Research and Technology of the United States Steel Corporation. In making the announcement Chairman E. H. Gary said something of the organization of the department, stating that immediately associated with Doctor Johnston will be an executive council for the purposes of consultation. On that council will be Dr. R. A. Millikan of the Normal Bridge Laboratory of Physics, Pasadena, Cal. The department will be responsible solely to the finance committee of the corporation, but it is the present intention, at least, for the executive council, according to Judge Gary's statement, to utilize the skill and experience of seasoned employees of subsidiary companies in starting and carrying on the work. The development of the department is the work of a committee of steel company officials headed by George Gordon Crawford, president Tennessee, Coal, Iron & Railroad Co.

It will be recalled that at the annual meeting of the Steel Corporation Chairman Gary told of the decision to develop the research organization within the corporation, and at that time he mentioned that Doctor Millikan would be identified with the movement. It is understood that the executive council may number four in all.

Doctor Johnston, who was born in Perth, Scotland,

Oct. 19, 1881, was educated at University College, Dundee, was Carnegie Scholar at St. Andrews, 1903-05; and 1851 Exhibition Scholar at Breslau, 1905-07. He was a member of the staff of the geophysical laboratory of the Carnegie Institution of Washington, 1907-16; was in charge of the research department of the American Zinc, Lead & Smelting Co. the following year and consulting chemist for the United States Bureau of Mines, 1917-18. He became professor of chemistry at Yale in 1919, meanwhile serving as secretary of the National Research Council.

DR. JOHN JOHNSTON

Doctor Millikan is director of the Normal Bridge Laboratory of Physics and chairman of the administrative council of the California Institute of Technology, Pasadena. Without enumerating the many degrees bestowed on him by institutions of learning in this country and abroad or mentioning the various medals awarded to him, it will suffice to note here, following what was said in our report of the corporation's annual meeting, that he received the Nobel prize of physics for isolating and measuring the electron.

### Court Affirms Commission's Right to Control Private Freight Cars

WASHINGTON, June 7.—Iron and steel, coal and railroad companies, as well as all other owners of cars, can be controlled by the Interstate Commerce Commission in the use of such equipment in times of car shortages, according to a decision of the Supreme Court of the United States handed down on Monday, last week, through Justice Brandeis. The finding was a defeat for a number of iron and steel and other concerns, which have opposed the so-called assigned car rule of the commission, and was a reversal of the opinion of the District Court of the United States for the Eastern District of Pennsylvania, which had enjoined the order of the commission. The opinion of the Supreme Court, while important, is held to be of less consequence than it would have been in former years when there were acute car shortages. The case directly related to the use of the cars for carrying coal.

Justice Brandeis declared that assigned cars are of two classes, privately owned and railroad fuel cars, and that the rule of the commission required that in determining how many cars are available in a district the carriers placing cars should count all of the cars, including those they own, all owned by "foreign" railroads and assigned for their fuel service and likewise all owned by private shippers and assigned for their service.

### Westinghouse Company Erects Fifth Welded Structure

Erection of the fifth arc-welded building of the Westinghouse Electric & Mfg. Co. has been started at Derry, Pa., by the Jones & Laughlin Steel Corporation. The building, to be erected by the "noiseless system," will be a one-story mill-type structure, 303 x 460 ft. and 25 ft. high at its middle bay. It will house kilns used in the manufacture of porcelain insulators. All structural members will be welded in the field, instead of in the shop, which has been the previous practice. The four Westinghouse buildings already erected by arc welding include a five-story transformer assembly building at Sharon, Pa., and a high-voltage laboratory, a chemical laboratory and a large garage at the East Pittsburgh works of the company.

### Expanding By-product Coke Plant at Utah Blast Furnace

SAN FRANCISCO, June 7.—Contract for construction of an additional battery of 23 by-product coke ovens, with a capacity of approximately 350 tons of coke a day, has been awarded the Koppers Co., Pittsburgh, by the Columbia Steel Corporation of this city, which operates coke ovens and a blast furnace at Ironton, Utah. The foundation work is under way, and the new ovens are expected to be in operation this fall.

The original installation at the Columbia Steel Corporation's Ironton plant was 33 ovens with a daily capacity of about 500 tons. With the completion of the new battery, the Ironton plant will have a daily capacity of about 850 tons, which will require about 1700 tons of coal daily, which is obtained from the mines of the corporation at Columbia, Utah.

The addition to the Ironton coke plant is understood to have been made necessary by contracts recently obtained by the corporation to supply about 300 tons a day to the International and the United States Smelting companies. At present practically the entire output of the Ironton plant is required by the corporation for its blast furnace.

### To Make Seamless Steel Pipe

The St. Louis Coke & Iron Corporation, Granite City, Ill., is going ahead with plans to enter the ranks of steel producers. The plans call for the building of four 100-ton open-hearth furnaces and a billet mill, while the finished product is to be seamless pipe, for the production of which a mill that will make pipe up to 22 in. in diameter is projected. The by-product coke plant is to be enlarged by the addition of 40 ovens. At present there are 80 by-product coke ovens, which in 1926 carbonized 633,488 tons of coal with a resultant yield of 500,000 tons of coke.

Sales and production conditions in the automobile industry are so spotty that it is difficult to arrive at an average for the whole business, says *Automotive Industries*. While the general level is undoubtedly around 10 per cent under that of a year ago, and while the trend is seasonally downward, these factors have not prevented a few of the outstanding companies from maintaining output at or near record high levels.



# Anglo-Russian Break Affects Trade

Survey of Available Data Indicates That Business, Controlled by Soviet Government, Is Placed Where Credit Is Extended  
—Potential Exports of American Machine Tools

BEFORE an answer can be given to the question, "What will rupture of Anglo-Russian diplomatic relations mean to American trade?" a number of factors must be considered. Among these are industrial development of Russia, volume and nature of Russian trade, both with America and Great Britain, and methods of finance. Enough information is available to warrant the conclusion that Russian purchases of metal and machinery in America will be confined to those lines in which we have acknowledged leadership, and will continue in but moderate volume as long as credit is not extended.

It should be remembered that Russian mining, manufacturing, transportation, and communication industries, and even foreign trading, are almost exclusively in the hands of State controlled trusts. Development and general policy is directed by the central government, and since 1921 has been consistently planned toward making Russia a self-contained nation in every possible respect. How this will work out in terms to foreign trade may be inferred from the recent history of the railroads.

## Russia's Railroad Self-sufficiency

Railroads were all but inoperative at the end of the period of military communism (April, 1921). It was recognized that this must be corrected before any other industry could recover, so large purchases of locomotives, rolling stock and supplies were made abroad and paid for in gold. Every effort was also bent to rehabilitate the shops, with the result that railroad equipment does not now figure among the imports. Russia in 1927 is not only able to keep some 46,000 miles of line operating satisfactorily, but 1400 miles of new track will be constructed and equipped in 1927, all with her own materials.

It may be concluded that imports will be made of materials and machines which Russia cannot produce, but only in such quantities as will make her economically independent. What yet remains to be done in this respect is indicated in Table I, compiled from information in the recently published "Commercial Handbook of the Union of Soviet Socialist Republics." It indicates that expansion will be in oil, cement and timber (which are exported in quantity), in mining, smelting, and machinery manufacture (which are far below pre-war capacity), in textiles and agricultural machinery (in which the whole country is impoverished).

Table I—Expansion of Russian Industry

Industry	Expenditures for Reconstruction and Replacement, Millions of Dollars		Present Production, Per Cent of 1913
	1926	1927	
Oil .....	58.6 (a)	68.0 (a)	108
Coal .....	47.4	59.8	98
Iron mining .....	11.4	11.4	37
Manganese mining .....			130
Salt mining .....			79
Platinum mining .....			16
Copper smelting .....		18.5 (b)	(c)
Iron and steel mfg. ....		94.0 (d)	56
Machinery .....		26.0 (e)	
Electrical machinery ..		8.3	160
Textiles .....		63.6 (f)	100
Paper mfg. ....	11.3	22.6	110 (g)
Chemical .....		29.1	
Cement, glass, china. .		25.0	73
Timber .....		12.1	(h)
All industries .....	400.7	487.7	111

- (a) Mostly spent in Germany.  
(b) Three copper and zinc plants under construction.  
(c) Present annual production approx. 21,000,000 lb. per annum.  
(d) Three plants authorized, total capacity 1 million tons billets yearly.  
(e) Two tractor plants; four plants for agricultural machinery.  
(f) Includes 1,200,000 cotton spindles.  
(g) Present annual imports 141,000 tons paper.  
(h) State forests about 15 per cent exploited.  
Of the total \$487,700,000 authorized for reconstruction

tion and replacement, about 60 per cent (roughly, \$275,000,000) will be used for new equipment, while the balance will go into new sites, structures, and housing. Only a portion of this will be imported, however, as can be inferred from the statement of imports, Table II (in millions of dollars), and from the

Table II—Summary of Foreign Trade of Russia

Fiscal Year	Total Turnover	Exports	Imports	Balance
1913 .....	1,490	...	...	...
1923 .....	199	...	...	...
1924 .....	485	...	...	...
1925 .....	667	296	371	Unfavorable 75
1926 .....	733	344	389	Unfavorable 45
1927 (6 mos.) ..	209	145	...	Favorable 64

knowledge that approximately half the imports are cotton, wool, and leather in various forms. Other major items are (in units of \$1,000,000):

Imports	Fiscal Year,	
	1926	1925
Ferrous metals .....	5.1	1.9
Non-ferrous metals .....	14.8	9.3
Tractors .....	7.1	5.3
Agricultural machinery .....	14.9	9.7
Automobiles and gas engines ..	6.5	2.7

From this summary of recent foreign trade and projected developments in Russia it may be concluded that \$100,000,000 would be the extreme maximum value of metals and machinery imported in 1927. This, of course, would be distributed among various nations. Records of imports given in Table III show that the United States has fallen from first to third in this race:

Table III—Russian Imports from Various Countries  
(Millions of Dollars)

From	1925	1926	1927 (5 months)
England .....	55	65	22
Germany .....	52	89	26
United States .....	102	61	19

Perhaps the only sound conclusion that can be drawn from this rapidly fluctuating situation is that Russia is buying to meet her pressing needs in that market which at the time can offer the most adaptable article at the best terms. Prediction of future trends cannot be based on the data. The best that can be deduced is the maximum value of the total trade.

To appraise the specific effect of the diplomatic break between Russia and Great Britain is equally difficult. Table III gives the total value of that trade. Details are unavailable, except that about one-quarter of the imports from England represents non-ferrous metals and machinery, and that the biggest item is textile machinery, which in 1926 was valued at \$6,000,000. These items would tend to gravitate toward America were trade relations entirely suspended. But the latter event is not likely. Table III shows that a sizable trade has been conducted with the United States despite the fact that no diplomatic relations exist between the two countries. The same will occur in England. The Russians appear to be too good traders to allow pique to interfere with their search for a bargain at good terms, and the English engineering industries need the business.

## The Matter of Credit Extensions

Extension of credit seems to be the most powerful factor in making the sales. The Amtorg Trading Corporation (the American representative of the principal Russian trusts) reports that a German credit of \$90,000,000 has resulted in orders for the following industries:

Metallurgical .....	\$24,000,000	Paper .....	\$4,500,000
Oil .....	9,000,000	Textile .....	2,900,000
Mining .....	9,000,000	Chemical .....	2,500,000
Electrical .....	10,000,000	Miscellaneous .....	13,000,000

These credits run from three to five years. News

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## Avoiding Mistakes and Improving Speed

UNIQUE in illustrating how possibilities for error may be overcome by newer methods of handling a manufacturing process, our leading article this week carries a suggestive note of deep significance. Most products lack the trouble-making quality of automobile license plates. Nevertheless the most nerve-wracking experience in operation is to have an order "go wrong." And when automatic or semi-automatic machinery can prevent mix-ups, by utilizing an almost mathematical precision, its installation should prove a saving investment.

Incidentally, the studies made to obtain this result provided also such a gage on speed that the equipment described is carefully attuned to synchronize with the highest continuous manual effort of the men removing the product from the delivering conveyor. Here again is matter deserving careful consideration by plant managers.

# This Issue in Brief

Activity of metal-consuming industries is greater than actual buying of steel indicates. With output curtailed and only moderate stocks in hands of producers and consumers, the signs point to more active buying within a few months.—Page 1675.

Employees' magazines are an important factor in modern industry. They increase the workman's knowledge of his job, and inform him of the most advanced and approved practices. By building esprit de corps, they keep down labor turnover.—Page 1680.

Machine tool users are receiving twice the engineering service demanded six years ago. This has been brought about by the steady trend toward special and semi-special machines. Meanwhile prices have risen little, and the volume of sales has actually decreased.—Page 1670.

Fluorspar, properly used, will not damage cupola lining, German foundry authority declares. Only when the proportion of fluorspar is increased beyond two parts limestone to one part fluorspar will the lining be badly attacked. In the proper proportions fluorspar aids desulfurization.—Page 1662.

Motor-driven rollers for steel mill roller tables are said to eliminate misalignment troubles. As each roller is an independent, self-contained power unit, the alinement difficulties experienced with gear-driven rollers are declared to be absent.—Page 1664.

No need to worry about iron ore reserves for two hundred years. The estimated world quantity of 30 billion tons in the ground is equivalent to about 10 billion tons of metal. But a large part of the reserves are not commercially available.—Page 1658.

No one has yet discovered how to change number dies automatically in stamping automobile license plates. The dies are still changed by hand, after each pair of plates has been stamped.—Page 1654.

Unloads foundry sand and coke in the same pit under railroad track. Maytag receives supplies in hopper cars. Conveyor is so arranged that sand and fuel may each be delivered to proper bins.—Page 1660.

New gripping device prevents damage to tin plate when loading on ship. Chain slings put all the strain on the top and bottom boxes and sometimes damage them. A new, patented self-locking grip distributes the strain and increases the loading rate 10 per cent.—Page 1680.

Operator has unobstructed view in new charging machine. Nothing interferes with his view of the end of the ram, the charge, the floor and the furnace interior. This new charger in the Timken plant is worm-gear driven; it operates very easily and is said to require less power.—Page 1667.

Automotive industry's operations are 10 per cent below last year's. Conditions are generally spotty and the present trend is seasonally downward.—Pages 1676 and 1682.

Private freight cars subject to commerce commission's orders in times of car shortage, Supreme Court rules. Reverses lower court's decision and gives commission full power to assign cars.—Page 1682.

Foreign buyers purchased more American machinery in April than in any other month since 1921. Total value of machinery exports was close to 40 million dollars.—Page 1715.

Use fluorspar in the cupola only when slag needs thinning. The total flux can then be reduced to two-thirds the normal quantity. The fluorspar gives clean melting and freedom from disturbance in slagging-off.—Page 1662.

Frees charging floor from encumbrances by locating the tilting mechanisms of electric furnaces directly back of the furnace foundations. In Timken plant the controls are on the platform above. The pouring floor is likewise free from obstacles, making it possible to move ladles quickly wherever desired.—Page 1666.

Unwise expansion of service can wipe out profits. Under the spur of competition, service is sometimes increased to such an extent that nothing remains on the right side of the ledger.—Page 1686.

Domestic demand for steel in Germany is so active that producers are little interested in export business. Mills are booked with orders for the next 90 days. Employment and output are increasing.—Page 1718.

Doubles output of license plates and reduces possibility of error by using duplicate sets of all-steel dies. Two plates are made at each stroke of the press. With former method of embossing one plate at a time, the mistake of making only one plate of the same number, or of making more than two, was not uncommon.—Page 1656.

May steel output was second highest May on record. Average daily production of 155,624 tons exceeded May, 1926, by 3 per cent. Output for first five months of year was only ½ per cent below record-breaking total of same period in 1926.—Page 1689.



ESTABLISHED 1855

# THE IRON AGE

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## An Envoy Extraordinary

IT is indeed fortunate that our unofficial ambassador to Europe, Capt. Charles A. Lindbergh, is the modest youth he has proved to be. Brave and strong he must have been, but it would also have been easy to have his head turned by the enthusiastic greetings and the fabulous offers of those anxious to capitalize his fame. At last all Europe has found that the United States can produce a man, who though tempted from all sides, yet remains a clean, wholesome, normal boy, ambitious only to continue a career which will promote aviation, his first love.

If we can believe what we read, this must be a glad surprise to many Europeans whose impressions of America have been gained from American tourists. Not all tourists are alike, of course, but as in all other human relations one tactless fool can do enough damage in a day for a dozen wiser men to correct in a year. We here at home can endure as best we may the noisy progress of the citizen with too much easy money, who knows that everything we have is the biggest and best, that everything we do is done right, that other peoples who do not do as we do are hopelessly decadent, and that mass production and scientific management will solve all the world's problems. Our friends abroad, however, cannot appraise properly the American "go-getter" in their midst. He bruises their sensibilities constantly. He places the dollar mark on everything.

This impression is doubtless enhanced by the reports of various commissions that study American methods of doing this, that and the other thing, as well as returning visitors, who unite in recommending the adoption of American business and manufacturing practices, without appreciating the fact that they have been developed by an isolated people, unhampered by tradition, in a land of tremendous area and enormous natural resources. Application in more restricted surroundings would be no more successful than transplanting a California redwood to a formal garden, nor more happy than caging an eagle. To understand American life—social and business life—Europeans must appreciate the en-

tire economic and geographic surroundings, as well as the history of the nation. To understand English, or French, or German, or Italian life, both social and business, Americans must know something of the entire economic and geographic surroundings, as well as the history of the nation. It is safe to say that mutual understanding and appreciation will grow as this knowledge increases.

So we are too fortunate for words in having Lindbergh. He, his deed, and his ship, typify most dramatically the youth, the enterprise, the over-leaping of bounds, of mechanical America, and in a manner that even the dullest can comprehend. He has done more in a fortnight to reveal the real American nation to Europe, than all the commissions, commissioners, ambassadors and unofficial observers since the European days of Herbert Hoover.

## Service Eating Up Profits

AT a time when profits are narrowing, industry is learning the lesson of restraint in price competition. There is a growing realization that the seller who takes business at the sacrifice of profit hurts himself as well as his competitor. It is not so commonly appreciated that competition in service may also go too far.

It has been said that it costs nothing to be courteous, and too frequently service, which in merchandising is an extension of courtesy, is regarded as something apart from the cost of doing business. Yet service, under the spur of business rivalry, is sometimes expanded until it endangers or wipes out profit. Jobbers of steel and heavy hardware, for example, are finding that the shrinking size of the individual order compels a charge for deliveries that heretofore have been made free.

In the machine tool industry, initiative and enterprise in developing equipment for low cost mass manufacturing have resulted in a rapid growth of engineering service. As is pointed out in an article in this issue, machine tool builders have been so engrossed in helping their customers solve production problems that the expense of the service rendered has crept up on them unawares. They are

now finding this an important item of cost. Since such cost is incurred in effecting great economies for users of equipment, machine tool makers believe, and rightly so, that the burden should be borne by those who are benefited. They are becoming group conscious, not only of the futility of cut-throat price competition, but of the folly of unlimited competition in service.

### Now Come the Graduates

THE girl graduate who had a serious conflict in the examinations for her two major studies, French and horsemanship, merely illustrates the tendency of modern schools to diffuse the energy of the students in a bewildering assortment of elective studies. High schools are no exception. Engineering colleges find needed hours for fundamental science crowded by courses in management, accounting, industrial relations, and other aspects of trade. Specialization in the extreme has come upon many of them. Witness a course designed exclusively to fit men for the manufactured gas industry!

College deans and curriculum committees would do well to examine critically a "demand" from prospective employers of their graduates which leads to the institution of such a course of study. When a man is hired, he is hired for a particular job. All business men like to get the most for their money; so the nearer the college graduate fits a particular job, the better the employer likes it, for the less it costs him in salary and training. College authorities, however, owe it to their students to resist this exploitation of graduates. Whether the student knows it or not, the best the college can do for him is to help him prepare for life, which is a broad river, continuing indefinitely, and not for a certain job, which is too often a blind alley, escaped at the earliest opportunity.

Business men in turn should not expect too much of the graduate. Even though the diploma says he is a bachelor of science in metallurgical engineering, it does not mean that he can analyze a complex situation and present a solution which is commercially sound. Many of the factors he knows nothing about, and could have learned nothing about because the conditions do not exist in the class room. They are life itself, and he is but a youth. If the new man can bring into the organization a new point of view, a new method of attack, even though on minor, insignificant problems, he will be worth his salary and perhaps much more.

### Progress in Rustless Iron

QUIETLY, progress is being made in this country on the problem of the commercial production of an alloy that will indefinitely withstand corrosion and yet be cheap enough for use in a large way. Already five American companies are in the market with various brands of rustless iron—the high-chromium, low-carbon steel. Fairly large scale production is being attained and at a cost that is gradually being lowered.

Three processes are available: One, involving the introduction of the chromium by means of a very low-carbon ferrochromium; another, the "direct process," which employs an electric furnace for the reduction of chromite; a third, the gaseous

reduction of a mixture of iron ore and chromite to metallic form (for most of the iron and part of the chromium), with subsequent melting to produce the alloy. Thus far the cost of rustless iron by any of these processes is too high. It is reported, however, that in Germany a process has been developed at a production cost of five cents a pound. The American product is now four to six times that figure.

It need not be said that considerable ground must be covered before the steel industry arrives at the production of a workable non-corrosive alloy so economically as to make rusting bridges and corroding cars things of the past. But with so much research talent, both in the United States and in Europe, concentrated on this chief problem of the conservation program, its solution cannot be indefinitely delayed.

### Pioneering and Research

FIFTEEN or twenty years ago it was a common remark of the less imaginative that the iron and steel industry had reached such a stage of development that further progress would be relatively slow. The rejoinder was readily made that the industry would, if anything, make greater progress in future. This opinion, however, was based upon faith in human ingenuity, and the generalization that there is always much to be learned. As a matter of fact the progress in recent years has been along different lines, by research rather than by pioneering.

Andrew Carnegie used to say that "pioneering doesn't pay." He was, however, a pioneer in doing things on a large scale after it had been proved in a small way that the things were feasible. Sometimes there is surprise at the amount of money large corporations are willing to spend in research work, even in investigations that seem to have no more than a "theoretical" end. However, in the old days also a great deal of money was spent, and much of the expenditure had no result except to prove the impossibility or undesirability of doing certain things.

We reflect nowadays on the useful things we have as a result of pioneering, but the failures are not visible today and it is well to refresh the memory as to some of these things and the amounts of money they cost. There was the dry air blast. It was presented as an accomplished fact, with a record of what had occurred, labeled as results. Immediately there arose a hot argument on both sides of the Atlantic. Theory claimed that what had occurred could not be direct "results" of the process. It is estimated that several million dollars were spent altogether in installations but the idea is now almost forgotten, though much of the fuel economy attained in latter-day blast furnace practice no doubt had its genesis in the dry blast agitation.

Then came the thin lined blast furnace, hailed as a great improvement. Several furnaces were rebuilt in accordance with the idea, and the total amount of money spent must have run well into seven figures; but there is probably not a furnace left in the country so operating.

The gas engine using blast furnace gas was a favorite some 20 years ago. In five years, 1906 to 1910, about a third of a million horsepower was installed. Then eyes were set upon the turbine.



Other cases might be cited. If it were said that research could have prevented, or could not have prevented, these large expenditures a fresh argument might be started; but this is clear—that research does not cost so much as the kind of pioneering that used to be done, and even if the object is not clear the information is likely to prove useful at some time. In general it is better to discover some law of nature than merely to ascertain that something, if undertaken in a certain, particular way, will “work.”

From the broader viewpoint, it is perfectly natural that the lines of progress in steel should have changed. First men learned how to make steel, and how to make it on a large scale and economically. Next they learned how to make better steel, both as to its character and as to its section, and indeed in many cases as to its surface finish. The progress is as great, or greater, measured in terms of service to mankind, and it is made by careful study rather than by large scale and expensive experimenting.

### High Accident Liability

SOME time ago the British Industrial Fatigue Research Board was under fire from the engineering press because of its methods in trying to work out a simple test which would detect persons abnormally susceptible to accidents before exposing them to danger. The research had been conducted as a psychological clinic among young workers at the Portsmouth dockyards and the Royal Air Force Establishment at Halton. The board was criticized because it continued its practice of employing no engineer familiar with the trades involved and sought no cooperation of any other person well acquainted with the various types of workers and their work.

To the American industrialist who has to do with the hiring and employment of labor there may be an element of humor in the way the investigators went about their task. The tests applied to the boys were of three distinct kinds. The first group, described as aestheto-kinetic, measured in different ways the reaction time or personal equation of the subject under various stimuli or signals for defined actions in response, the worker's performance being measured in some tests by the accuracy with which he responded at top speed. The second group was designed to test ocular balance (manifest or latent squint), tremor and changes in the conductivity of the body. All of these are said to be related to “temperamental instability,” by which is meant the factors in an individual's make-up that unconsciously affect his nervous and emotional reaction to his environment. The third group consisted of two tests involving reasoning, the one scholastic, the other mechanical. The attempt was then made to correlate the results of all the tests.

Abnormal susceptibility to accidents is well recognized. It may be determined after a man or woman gets to work, for the trained eye recognizes the characteristics which point out a poor hazard. A plant is usually glad to get rid of such individuals, and should be able to do so, for they are the exception and not the rule. But when one brings to mind any typical group of applicants for jobs in a factory employment office it is difficult to conceive of any dependable system of tests which would eliminate

on the spot the absent-minded, the refractory, the clumsy-bodied, the careless, the reckless, the heedless. Perhaps such a system may eventually be evolved. But the average employer will agree with the *Engineer* in saying that “it needs no ghost or other intelligence, come from a psychological laboratory with a manual of statistics in its pocket, to tell us that probably the dexterous and careful worker will have a better chance than his clumsy, wool-gathering or reckless comrade of avoiding the circumstances that produce accident, or of escaping from them with a whole skin.”

BY no means rapidly are British steel mills regaining the export markets lost during last year's coal strike. Since the ending of the long conflict last December there has been a gradual increase, the average for the first four months of 1927 having been 289,600 gross tons. This compares with 310,900 tons per month in 1925 and 321,100 tons in 1924. Even in 1926 the movement before the strike was sufficient to bring the average up to 249,000 tons. It is significant that in pig iron, and in such finished steel products as black sheets, galvanized sheets, tin plate, rails and wire, exports thus far this year are even less than in 1926. American exports in some of these products exceed those of last year to May 1.

### Anglo-Russian Break Affects Trade

(Concluded from page 1683)

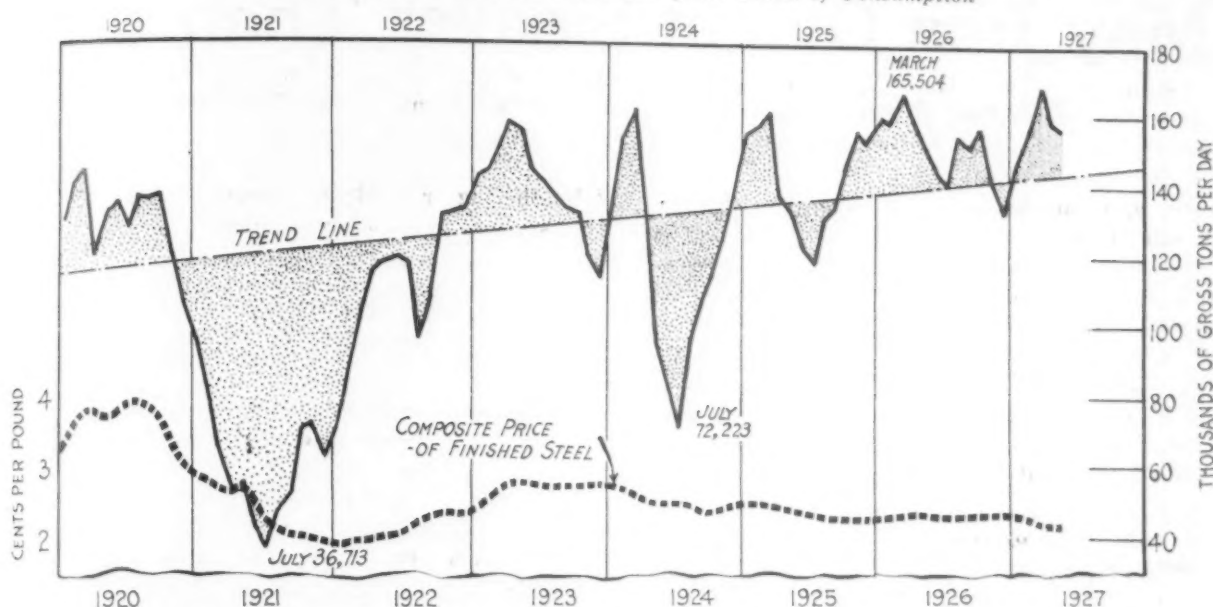
dispatches from England also indicate that British labor is friendly toward Russia, and that Russian exports have been of material aid in reducing unemployment in the engineering trades. For such reasons \$50,000,000 credits were extended last year by cooperative banks, an equal amount reported on May 15 from the Midland bank, and another \$5,000,000 credit by three individual firms on orders for oil well equipment, electrical equipment, and boilers. For the American situation in contrast, an official of the Amtorg Trading Corporation said that \$5,000,000 represented the maximum amount of floating credit they had been able to negotiate in the United States. There is no doubt one important factor in the drop in American trade.

Summarizing the immediate situation, it appears that Germany has stolen a march on her competitors by offering a timely and liberal credit, and received orders for the major portion of the expected machinery business for 1927. Great Britain's trade in non-ferrous metals, textile and electrical machinery, will continue as long as she continues buying the largest share of Russian oil and timber. America cannot expect any material increase in machinery or metals, but will continue to send over non-ferrous metals, mining and smelting machinery, automobiles, tractors, and agricultural machinery, in which she is in a position to make attractive offerings even for small credits or cash. This latter may be somewhat less restrictive now that Russia has a healthy balance of trade in her favor.

In view of Russia's avowed intention to place her industries on a mass production basis as soon as opportunity permits, and also in view of her extreme poverty in machinery manufacturing plants and her backward electrical development, there should be a fairly large volume of trade in machine tools and electrical equipment in future years. Since American experts are being retained by the Russian government, it would appear that American machine tools and electrical equipment should receive most favorable consideration and form a very large volume of business in the next few years, providing the financial factors can be arranged to mutual advantage.



Production of Steel Ingots in May, While Less Than in April, Was the Second Largest May on Record. It Is Still Well Above the Line Representing the Trend of Consumption



## Steel Ingots 2 Per Cent Lower in May

Daily Output 155,624 Tons, or a Drop of 3220 Tons—  
3 Per Cent Ahead of May, 1926

PRODUCTION of steel ingots in May is reported by the American Iron and Steel Institute as 4,046,214 gross tons, based on returns from companies which, in 1926, made 95.01 per cent of the total production. Figuring on 26 working days, this gives 155,624 tons per day, compared with 158,844 tons in April, from the same number of working days and a total output of 4,129,952 tons. For the five elapsed months of the calendar year the production is given as 20,308,375 tons, or about  $\frac{1}{2}$  per cent lower than the record-breaking total in 1926 of 20,419,656 tons. Average daily output for the five months is 157,429 tons, against 158,292 tons from the same number of working days a year ago.

Except for May, 1923, the production last month was the largest for any May on record. In May, 1923, a total of 4,216,355 tons was turned out in 26 days, representing 156,161 tons per day. In May, 1917, the

production is estimated by THE IRON AGE at 4,060,800 tons, or an average of 150,400 tons in 27 working days—one day more than in the other instances.

In reporting the percentage relation between output and capacity, the institute has reverted to the so-called "practical capacity" as the base. This practical capacity is given for 1926 as 50,000,000 gross tons of ingots, that being the estimated capacity at the beginning of that year. For 1927 the estimate is based on 51,000,000 tons, as of Dec. 31, 1926. On this basis operation in May was at 94.90 per cent, against 96.86 per cent in April, and 102.42 per cent in March.

As has been the case for some years, the calculated production for all companies is based upon the assumption that the companies not reporting made the same percentage of the monthly total that those same companies made in 1926, compared with the annual total. As the non-reporting companies made less than 5 per cent of the total ingot tonnage in 1926, a considerable error in estimating their monthly production would have only an insignificant effect on the total calculated monthly output of all companies.

### Production of Steel Ingots

Months	(Gross Tons)			Calculated Monthly Production All Companies	Approximate Daily Production All Companies
	Reported by Companies Which Made 95.01 Per Cent of the Steel Ingots in 1926				
1927	Open-Hearth	Bessemer	All Other		
Jan.	3,041,233	545,690	10,586	3,786,453*	145,633*
Feb.	3,042,232	565,201	13,237	3,810,830*	158,785*
March	3,701,418	590,716	16,499	4,534,926*	167,960*
April	3,340,852	565,634	17,381	4,129,952	158,844
May	3,272,810	557,683	13,815	4,046,214	155,624
5 Mos.	16,398,545	2,824,924	71,518	20,308,375	157,429
1926					
Jan.	3,326,846	581,683	13,664	4,132,210*	158,931*
Feb.	3,023,829	556,031	12,818	3,785,051*	157,710*
March	3,590,791	635,680	15,031	4,468,617*	165,504*
April	3,282,435	601,037	13,652	4,105,799*	157,915*
May	3,201,230	516,676	10,437	3,927,979*	151,076*
5 Mos.	16,425,131	2,891,107	65,602	20,419,656	158,292
1925					
June	3,036,162	498,764	9,441	3,734,153*	143,621*
July	2,911,375	526,500	12,372	3,634,993*	139,807*
Aug.	3,145,055	627,273	12,003	3,986,966*	153,345*
Sept.	3,089,240	612,588	12,660	3,913,383*	150,515*
Oct.	3,224,584	630,526	12,348	4,074,544*	156,713*
Nov.	2,915,558	582,239	9,605	3,705,744*	142,529*
Dec.	2,788,479	493,172	8,919	3,466,766*	133,337*
Total	37,535,584	6,872,169	142,950	46,936,205*	150,920*

\*Adjusted to final returns for 1926.

### Establish the Lancaster Malleables & Steel Corporation

BUFFALO, June 7.—Announcement is made that a group of Lancaster, N. Y., business men, comprising the Lancaster Malleables & Steel Corporation, has completed the purchase of the Lancaster plant of the American Malleables Co. The plant has been idle since New Year's day when the finishing department burned. Work has begun on the new finishing department and it is hoped to complete this in time to begin operations in July.

The new company was organized and promoted by J. F. Patterson, formerly of the Gould-Coupler Co., Depew, N. Y. He was elected secretary and will be in charge of sales of the new organization. W. B. Symmes, New York, is president. The other officers include: Bert R. Weidle, formerly of the American Radiator Co., Buffalo, and Frank C. Johnson, formerly with the American Malleables Co. The four officers are the stockholders. The American Malleables Co., from which the plant was purchased, has another plant in Owosso, Mich.

# May Iron Output Smaller Than April

Actual Returns Show Daily Rate Last Month Was 4689 Tons  
or 4.1 Per Cent Less Than in April—Net Loss  
of Nine Furnaces

ACTUAL data for the pig iron production for May show the estimates published last week to have been within 115 tons per day of the real output. The final figures make the May production 109,385 tons per day. This compares with 114,074 tons per day in April. The May output was therefore 4689 tons per day, or 4.1 per cent less than that of the preceding month. The next smallest rate this year was 105,024 tons per day in February. In May, last year, the daily rate was 112,304 tons, making May this year 2919 tons per day, or 2.6 per cent less than a year ago.

Production of coke pig iron for the 31 days in May was 3,390,940 gross tons or 109,385 tons per day as compared with 3,422,226 tons or 114,074 tons per day for the 30 days in April.

## Capacity Active on June 1

With 12 furnaces shut down and only 3 blown in during May, the net loss was 9, the same as the estimate last week. In April the net loss was 3 furnaces while in March there was a net gain of 6 furnaces. Of the 12 furnaces blown out or banked in May, 5 are

credited to independent steel companies and 4 to the Steel Corporation. Three merchant stacks were shut down. The three furnaces blown in include one independent steel company stack and two merchant.

On June 1 there were 211 furnaces in blast as

	Steel Works	Merchants*	Total
May, 1926	86,682	25,622	112,304
June	82,186	25,658	107,844
July	79,392	24,586	103,978
August	78,216	25,025	103,241
September	81,224	23,319	104,543
October	83,188	24,365	107,553
November	82,820	25,070	107,890
December	74,909	24,803	99,712
January, 1927	75,609	24,514	100,123
February	80,595	24,429	105,024
March	86,304	26,062	112,366
April	87,930	26,144	114,074
May	84,486	24,899	109,385

\*Includes pig iron made for the market by steel companies.

	May (31 days)	April (30 days)	March (31 days)	Feb. (28 days)
New York and Mass.	227,105	224,933	232,561	198,877
Lehigh Valley	87,198	88,409	97,046	83,712
Schuylkill Valley	74,892	79,693	86,357	75,063
Lower Susq. and Lebanon Valleys	41,274	47,828	52,922	42,753
Pittsburgh district	680,858	713,181	725,418	604,415
Shenango Valley	123,075	127,760	127,295	100,142
Western Penna.	116,771	131,359	126,905	102,912
Maryland, Virginia and Kentucky	106,601	96,880	99,366	90,620
Wheeling district	150,487	152,155	136,116	113,632
Mahoning Valley	275,904	280,266	301,941	265,389
Central and North- ern Ohio	346,620	333,866	353,977	303,080
Southern Ohio	43,995	44,762	47,567	42,189
Illinois and Indiana	705,759	690,308	661,496	534,605
Mich., Minn., Mo., Wis., Colo. and Utah	147,755	149,656	156,405	140,730
Alabama	250,456	251,401	271,097	236,786
Tennessee	12,190	9,769	6,893	5,774
Total	3,390,940	3,422,226	3,483,362	2,940,679

## Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1922—Gross Tons

	1923	1924	1925	1926	1927
Jan.	104,181	97,384	108,720	106,974	100,123
Feb.	106,935	106,026	114,791	104,408	105,024
Mar.	113,673	111,809	114,975	111,032	112,366
Apr.	118,324	107,781	108,632	115,004	114,074
May	124,764	84,358	94,542	112,304	109,385
June	122,548	67,541	89,115	107,844	.....
½ year	115,147	95,794	105,039	109,660	.....
July	118,656	57,577	85,936	103,978	.....
Aug.	111,274	60,875	87,241	103,241	.....
Sept.	104,184	68,442	90,873	104,543	.....
Oct.	101,586	79,907	97,528	107,553	.....
Nov.	96,476	83,656	100,767	107,890	.....
Dec.	94,225	95,539	104,853	99,712	.....
Year	109,713	85,075	99,735	107,043	.....

Furnaces:	Total Stacks	June 1— In Blast	Capacity per Day	May 1— In Blast	Capacity per Day
New York:					
Buffalo	21	12	5,615	12	5,565
Other N. Y. and Mass.	6	4	1,690	4	1,790
New Jersey	3	0	....	0	....
Pennsylvania:					
Lehigh Valley	11	6	2,580	6	2,670
Spiegeleisen	2	2	290	2	275
Schuylkill Valley	12	5	2,060	6	2,655
Susquehanna Valley	4	3	1,275	3	1,340
Ferro. and Spiegel	1	1	60	1	675
Lebanon Valley	0	....	....	0	....
Ferromanganese	2	0	....	0	....
Pittsburgh District	52	34	20,365	40	23,135
Ferromanganese	4	2	385	1	235
Shenango Valley	13	8	3,970	8	3,890
Western Pennsylvania	18	6	3,360	7	3,940
Ferromanganese	2	2	420	2	440
Maryland	5	6	2,765	6	2,530
Ferromanganese	1	0	....	0	....
Wheeling District	13	9	4,855	9	4,670
Ohio:					
Mahoning Valley	26	15	8,850	15	9,040
Central and Northern	23	19	11,165	19	11,060
Southern	13	5	1,420	5	1,490
Illinois and Indiana	44	35	22,690	36	22,640
Mich., Wis. and Minn.	12	6	2,880	6	2,835
Colo., Mo. and Utah	7	4	1,875	4	1,925
The South:					
Virginia	14	1	230	1	210
Spiegeleisen	1	0	....	1	860
Kentucky	5	2	660	1	330
Alabama	34	20	7,540	22	8,300
Ferromanganese	1	1	70	1	80
Tennessee	12	3	395	2	325
Total	362	211	107,445	220	112,955

## Production of Steel Companies for Own Use—Gross Tons

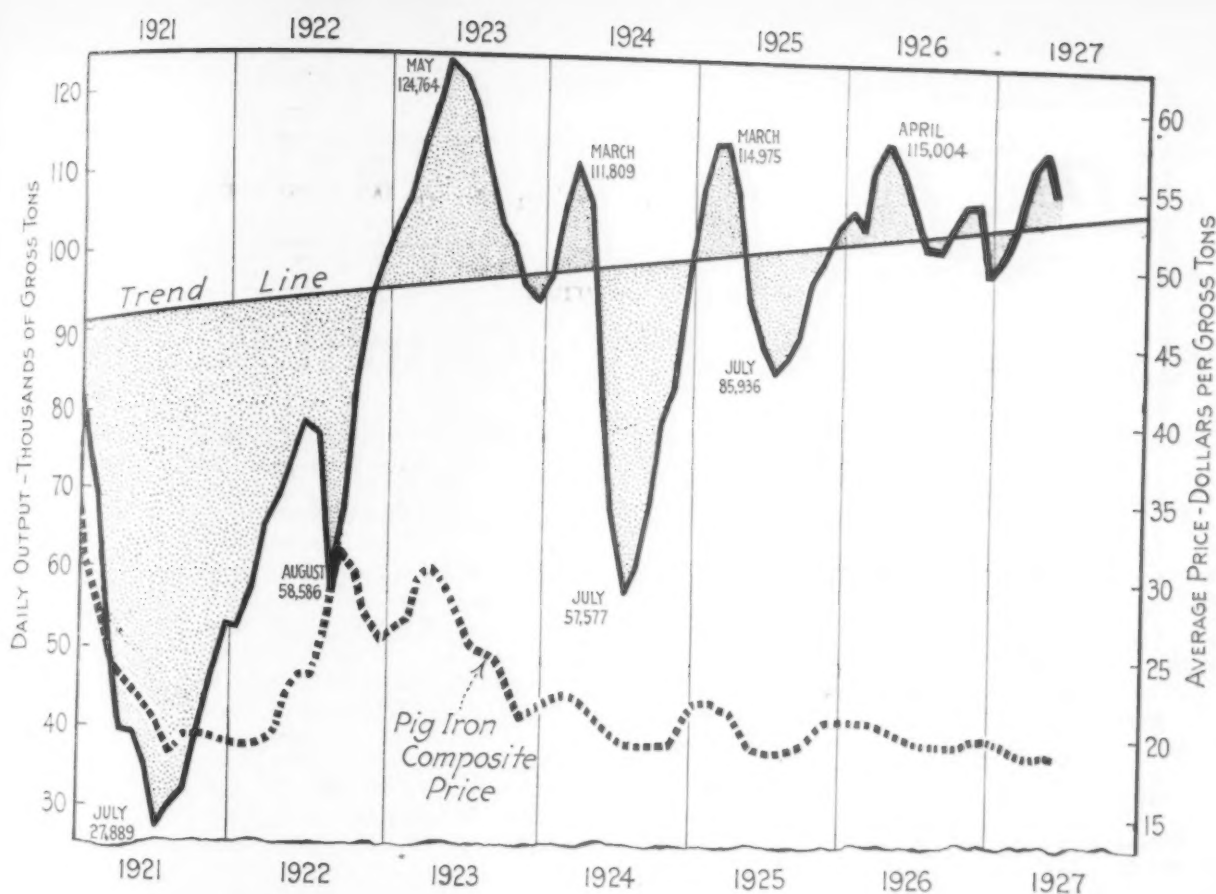
	Total Iron, Spiegel and Ferro	Spiegeleisen and Ferromanganese*
	1926	1927
Jan.	2,599,876	2,343,881
Feb.	2,272,150	2,256,651
Mar.	2,661,092	2,675,417
Apr.	2,677,094	2,637,919
May	2,687,138	2,619,078
June	2,465,583	2,537,8
½ year	15,362,933	14,817,3
July	2,461,161	26,877
Aug.	2,424,687	23,557
Sept.	2,436,733	25,218
Oct.	2,578,830	28,473
Nov.	2,484,620	31,903
Dec.	2,322,180	31,627
Year	30,071,144	315,828

\*Includes output of merchant furnaces.

## Production of Coke and Anthracite Pig Iron in United States By Months, Beginning Jan. 1, 1924—Gross Tons

	1925	1926	1927
Jan.	3,370,336	3,316,201	3,103,820
Feb.	3,214,143	2,923,415	2,940,679
Mar.	3,564,247	3,441,986	3,483,362
Apr.	3,258,958	3,450,122	3,422,226
May	2,930,807	3,481,428	3,390,940
June	2,673,457	3,235,309	.....
½ year	19,011,948	19,848,461	.....
July	2,664,024	3,223,338	.....
Aug.	2,704,476	3,200,479	.....
Sept.	2,726,198	3,136,293	.....
Oct.	3,023,370	3,334,132	.....
Nov.	3,023,006	3,236,707	.....
Dec.	3,250,448	3,091,060	.....
Year*	36,403,470	39,070,470	.....

\*These totals do not include charcoal pig iron. The 1926 production of this iron was 163,880 tons.



**Daily Pig Iron Output in May Was 4.1 Per Cent Lower Than in March; Composite Price Decreases**  
*Inclined Line represents the gradually increasing theoretical needs of the country, and shows that production is still above the so-called normal. Dotted line represents THE IRON AGE composite price*

against 220 on May 1. The estimated operating rate of these 211 furnaces was 107,445 tons per day as compared with 112,955 tons per day for the 220 furnaces active on May 1.

#### High Ferromanganese Output

Ferromanganese production in May was 28,734 tons, next to the largest this year, when 31,844 tons was made in January. May spiegeleisen output was 9788 tons as compared with 12,907 tons in April, the highest for many months.

#### Possible Active Furnaces Reduced

The list of possible active furnaces has been reduced from 364 to 362. The Robeson furnace in the Lebanon Valley and the Alleghany furnace of the Alleghany Ore & Iron Co. in Virginia are being scrapped.

#### Furnaces Blown In and Out

The following furnaces were blown in during May: The Norton furnace of the American Rolling Mill Co. in Kentucky; No. 5 Iroquois furnace of the Youngstown Sheet & Tube Co. in the Chicago district and the Rockdale furnace of the Roane Iron Co. in Tennessee.

Among the furnaces blown out or banked during May were No. 3 Swede furnace in the Schuylkill Valley; No. 3 Clairton furnace of the Carnegie Steel Co.; one Aliquippa furnace of the Jones & Laughlin Steel Corporation; No. 2 Midland furnace of the Pittsburgh Crucible Steel Co.; No. 1 Monessen furnace of the Pittsburgh Steel Co. and the Clinton furnace in the Pittsburgh district; D furnace at the Cambria plant of the Bethlehem Steel Corporation in Bethlehem, Pa.; the Oriskany furnace of the E. J. Lavino & Co. in Virginia; one Madeline furnace of the Inland Steel Co. and one Gary furnace in the Chicago district and the Alice and Oxmoor furnaces of the Tennessee Coal, Iron & Railroad Co. in Alabama.

#### Blast Furnace Notes

New high monthly production records were made last month by the Mary furnace, Sharon Steel Hoop Co., Lowellville, Ohio, which running on basic iron turned out 13,580 tons; the Tonawanda furnace, Tonawanda Iron Corporation, Buffalo, running on high-silicon foundry iron, yielded more than 15,580 tons, and the furnace of the Sharpsville Furnace Co., Sharpsville, Pa., with close to 13,800 tons of basic iron.

The Wickwire-Spencer Steel Co., Buffalo, will blow in one of its Harriet furnaces on July 1.

The Bethlehem Steel Co. has blown out E furnace at Steelton, Pa., for relining. A block of 40 Semet-Solvay coke ovens at that plant also has been shut down and will probably be replaced by new ovens.

#### Thomas Furnace Sold at Sheriff's Sale

Assets of the Thomas Furnace Co., 740 Kinnickinnic Avenue, Milwaukee, Wis., manufacturer of low phosphorus and other pig iron, were bid in for \$300,000 by S. G. Garraway, of the Garraway Investment Co., Chicago, at a sheriff's sale on June 2. The concern was placed in a circuit court receivership several months ago after failure to pay interest on a mortgage bond issue of approximately \$800,000, and a foreclosure sale was ordered subsequently. While no official statement has been made by the purchaser, it is understood that a new corporation will be organized to continue the operation of the plant.

"Impending Changes in Our Use of Fuels" was the title of an address by Dr. Arthur D. Little at the May meeting of Engineering Foundation. The address has been printed in a pamphlet, which will be mailed in response to requests addressed to Engineering Foundation, 29 West Thirty-ninth Street, New York.



# Iron and Steel Markets

## Buying Recedes But Output Holds

First-half Steel Production May Duplicate Last Year's  
Record—Autobody Sheets Sold at Higher Prices—  
Weakness in Steel Bars—Large Railroad Purchases

STEEL demand, while showing in the first full week of June continued gradual recession in new business, is releasing sufficiently increased tonnage against orders for such material as sheets, strips and pipe to keep operations on the whole substantially unchanged. Again does the activity, in the light of reduced railroad and agricultural purchases, serve to show the heavy consumption of industry in general.

Expectation that the production of steel ingots for the first half of the year will be equal to the high record of 24,154,000 gross tons of the first half of 1926 is strengthened by the figures for May. The output of 4,046,200 tons is only 2 per cent off from April and brings the five months to one-half per cent under the total of the same period a year ago.

Close matching of the record would follow a reduction of as much as 5 per cent in June from May, as occurred last June, although the month so far does not indicate so steep a decline. May as well as February, March and April were each larger production months this year than last.

What may be taken as the first test of sheet prices was several fair sized sales of autobody sheets for delivery after July 1 at the advance to 4.25c., Pittsburgh, set up some weeks ago. The buyers are numbered among those who usually secure concessions.

Against this movement and some business from the automobile trade in cold-rolled strips placed at the new higher quotations, is evidence, particularly in the East, of weakness in the heavy tonnage products. Quotations of 1.80c., Pittsburgh basis, appear freer on especially attractive lots of steel bars, with 1.75c. named on good tonnages of plates and 1.75c., and as low as 1.70c., on structural material. Spirited competition between Carnegie and Bethlehem special sections has developed.

The week was notable in railroad car purchases, the total being in excess of all the cars bought last month. The Illinois Central ordered 4500 freight cars and the Reading 1000. The Illinois Central also covered for 15 locomotives and the New York Central for 39.

Structural steel lettings for the week total 23,600 tons, mostly in small work. Projects under negotiation call for 25,000 tons, including 8900 tons for New York subway construction.

Pittsburgh reports bookings of 24 barges requiring 3600 tons of plates and small shapes, making 45 in all lately placed.

Increased shipments of large diameter gas piping are making up to a large extent for losses in oil well tonnage. The National Tube Co. booked an order from the Prairie Oil Co. for 100 miles of 16-in. and 60 miles of 12 $\frac{3}{4}$ -in. pipe, and a 300-mile line of 22-in. pipe is reported closed.

Comparatively large specifications received by strip makers against second quarter tonnages have quickened the demands on producers of billets and slabs.

Revised figures of May's pig iron output show a daily production of 109,385 tons, or 4.1 per cent below the April average. The 211 furnaces in blast on June 1 were making iron at a daily rate of 107,445 tons, compared with 112,955 tons on May 1 for the 220 stacks then active.

Pig iron melt is improving in the New York metropolitan area and in the Detroit district, where automotive foundries are going into full production of castings for new models. Generally, however, shipments to foundries are considerably below those of a year ago and iron now on order will be carried well into the third quarter. Although some inquiry for next quarter is appearing at Cleveland, New York and Buffalo, heavy buying for that delivery is not looked for. A steel company on the Ohio River has bought 1000 tons of basic iron for barge delivery from East St. Louis.

Scrap is weak, with declines in heavy melting steel at Chicago, St. Louis and Buffalo. A recent shipment of 5000 tons of old carwheels from New Orleans to Japan reflects a heavier demand for scrap in that country following reduced ore shipments from China.

Spot furnace coke at Connellsville is firmer, but only to the extent that freshly drawn coke is encountering less competition from loaded cars.

British makers did not gain much, apparently, by their reduction of ferromanganese to \$90, Atlantic seaboard. A liberal estimate of American requirements over the last half which they will supply does not exceed 7000 tons.

German exporting of steel is dull, in contrast with unusually active domestic conditions, but increased rebates have been established to further German exports in manufactured products.

Both of THE IRON AGE composite prices remain unchanged, that for pig iron standing at \$19.07 a ton for the fourth week, and that for finished steel at 2.374c. a lb. for the second week.

# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
No. 2, fdy., Philadelphia...	\$21.76	\$21.76	\$21.76	\$22.26
No. 2, Valley furnace....	18.50	18.50	18.50	18.00
No. 2, Southern, Cin'ti....	21.69	21.69	21.69	24.69
No. 2, Birmingham.....	18.00	18.00	18.00	21.00
No. 2 foundry, Chicago*..	20.00	20.00	20.00	21.00
Basic, del'd eastern Pa....	20.75	20.75	20.75	21.75
Basic, Valley furnace....	18.00	18.00	18.50	18.00
Valley Bessemer, del'd P'gh	20.76	20.76	21.26	20.76
Malleable, Chicago*.....	20.00	20.00	20.00	21.00
Malleable, Valley.....	18.50	18.50	18.50	18.00
Gray forge, Pittsburgh....	19.76	19.76	19.76	19.26
L. S. charcoal, Chicago....	27.04	27.04	27.04	29.04
Ferromanganese, furnace.	90.00	90.00	95.00	88.00

Rails, Billets, etc., Per Gross Ton:	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
O-h. rails, heavy, at mill..	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O-h. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O-h. sheet bars, P'gh....	33.50	33.50	34.00	36.00
Forging billets, P'gh.....	39.00	39.00	39.00	40.00
O-h. billets, Phila.....	39.30	39.30	39.30	40.30
Wire rods, Pittsburgh.....	42.00	42.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.90	1.90

Finished Iron and Steel,	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh....	1.85	1.85	1.85	2.00
Steel bars, Chicago.....	2.00	2.00	2.00	2.10
Steel bars, New York....	2.14	2.19	2.19	2.34
Tank plates, Pittsburgh...	1.80	1.80	1.85	1.85
Tank plates, Chicago....	2.00	2.00	2.00	2.10
Tank plates, New York...	2.09	2.14	2.19	2.24
Beams, Pittsburgh.....	1.80	1.80	1.80	1.90
Beams, Chicago.....	2.00	2.00	2.00	2.10
Beams, New York.....	2.09	2.14	2.14	2.24
Steel hoops, Pittsburgh...	2.30	2.30	2.30	2.50

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	2.80	2.95
Sheets, black, No. 24, Chi-				
cago dist. mill.....	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.65	3.85
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.95	3.95	3.95	4.05
Sheets, blue, 9 & 10, P'gh.	2.25	2.25	2.20	2.35
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh....	2.50	2.50	2.50	2.65
Wire nails, Chicago dist.				
mill.....	2.55	2.55	2.60	2.70
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist.				
mill.....	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh..	3.20	3.20	3.25	3.35
Barbed wire, galv., Chi-				
cago dist. mill.....	3.25	3.25	3.30	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
Heavy melting steel, P'gh..	\$15.00	\$15.00	\$15.50	\$15.50
Heavy melting steel, Phila.	14.00	14.00	14.00	15.00
Heavy melting steel, Ch'go	12.00	12.25	12.25	12.00
Carwheels, Chicago.....	13.50	13.75	14.25	15.00
Carwheels, Philadelphia...	15.50	16.00	16.00	17.00
No. 1 cast, Pittsburgh....	15.50	15.50	15.75	16.00
No. 1 cast, Philadelphia...	16.00	16.50	17.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	15.00	16.00	15.75
No. 1 RR. wrot, Phila....	16.00	16.50	16.50	16.50
No. 1 RR. wrot, Ch'go (net)	11.00	11.00	11.50	11.00

Coke, Connellsville, Per Net Ton at Oven:	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
Furnace coke, prompt....	\$2.90	\$2.90	\$3.00	\$2.90
Foundry coke, prompt....	4.00	4.00	4.00	4.00

Metals,	June 7, 1927	May 31, 1927	May 10, 1927	June 8, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	12.87 1/2	12.75	13.12 1/2	14.00
Electrolytic copper, refinery	12.50	12.37 1/2	12.75	13.57 1/2
Zinc, St. Louis.....	6.25	6.07 1/2	6.15	7.05
Zinc, New York.....	6.00	6.42 1/2	6.50	7.40
Lead, St. Louis.....	6.10	6.02 1/2	6.40	7.47 1/2
Lead, New York.....	6.45	6.37 1/2	6.75	7.65
Tin (Straits), New York...	68.00	67.00	68.00	58.75
Antimony (Asiatic), N. Y.	12.75	13.25	13.75	11.50

## Pittsburgh

### Decline in Steel Business Is Gradual— Ingot Output Holds at 70 Per Cent

PITTSBURGH, June 7.—The first full week of the new month has developed no new tendencies in the steel market. Total business in the past week has shown a loss as compared with that of last week, but as has been true over the past few weeks the decline is a gradual one and is not noticeable in the rate of plant operations, because a decrease in activity in some products is offset by increases in the demand for others and substantially the same amount of ingot production is necessary. For the third week running, ingot output in this and nearby districts is estimated at approximately 70 per cent of capacity. The market is moving within narrow limits as to business, production and prices. It is a typical market for the time of year, with orders numerous enough, but individually small, and with almost every purchase tagged with a rush order.

The automotive industry is not buying against the new models that will begin to appear in the next 30 or 45 days, but is taking the steel necessary to complete production schedules of present series cars. The railroads do not yet appear to have made up their budgets for the latter part of the year. Plans for the curtailment of oil production to bring about a more stable situation in that industry have not yet been successful, and it looks as if the last half of the year would not be any better in oil well pipe sales than the first five months of this year. For the present the steel manufacturers must depend upon the business

provided by those consuming industries that are not usually classified and the fill-in tonnages from the major consuming channels.

In connection with steel prices, the interesting feature is the apparent success that has attended the efforts of sheet and strip makers to put their markets on a more profitable basis. Automobile companies have paid the higher prices on both products. But the general market is not yet taking a cue from that development, and even the term "steady" cannot yet be faithfully applied to the heavy tonnage products or to wire products, at least so far as the business outside the Pittsburgh district is concerned.

Pig and scrap are quite as inactive as they have been, and the fuel situation has changed only to the extent that a curtailment in the output of coke has reduced the number of loaded cars and made it more readily possible for producers to get their asking prices on freshly drawn coke. Except on contract business, coal producers are unable to get more than cost out of their product.

**Pig Iron.**—No improvement is observed in demand, nor are melters evincing much interest in third quarter requirements beyond making inquiry as to prices. Foundry iron needs for the third quarter are expected to be rather moderate, since important consumers, notably the oil well supply companies and the sanitary ware manufacturers, are likely to carry over some of their first half purchases. A sale of 200 tons of malleable iron at \$18.50, Valley furnace, stands out in the week's business because there were no other individual sales that large. Such business as is being done is at recent quotations. The Bethlehem Steel Co. recently took off a blast furnace at Johnstown, Pa., leaving six of the nine there active, but the Youngs-



town Sheet & Tube Co. has put on one of its Hubbard, Ohio, furnaces.

Prices per gross ton f.o.b. Valley furnace:

Basic .....	\$18.00
Bessemer .....	19.00
Gray forge .....	18.00
No. 2 foundry .....	18.50
No. 3 foundry .....	18.00
Malleable .....	18.50
Low phosphorus, copper free....	28.00

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

**Ferroalloys.**—British makers of ferromanganese, it is believed, did not profit much by the fact that they were first to quote a price of \$90, Atlantic seaboard, and between 6000 and 7000 tons is regarded as a liberal estimate of the American requirements over the last half of the year that will not be supplied by domestic interests. Principal users of spiegeleisen have contracted for their last half requirements at the same prices as ruled over the first six months of the year. Spot tonnages seem ample for the few consumers who did not anticipate their needs. Specifications on contracts for 50 per cent ferrosilicon are coming along steadily.

**Semi-Finished Steel.**—There has been some quickening lately in the consumption of billets and slabs by strip makers, who have been getting comparatively large specifications on second quarter tonnages and have found it necessary to increase instead of cut their mill schedules. The result has been more liberal releases on contracts for billets and slabs, and new orders are a little more numerous than they were recently. There has been no change in prices of steel in these forms or in sheet bars, which are no more active than they have been, since current demands for sheets are small and non-integrated makers are well supplied against the orders they have on their books. On the general run of orders wire rods still carry prices of \$42 to \$43, base, Pittsburgh or Cleveland, and makers here say that lower prices reported from other markets refer to sales by producers who lack regular consuming connections or by those anxious to liquidate a surplus. Open market activity in skelp is limited.

**Structural Steel.**—The local market on large structural shapes is holding at 1.85c. to 1.90c., base Pittsburgh, the same prices that ruled a month ago on the general run of orders. The market is really steady at that range, which occasionally on small lots is exceeded by \$1 a ton. These prices are not obtainable on the jobs that are desirable from a tonnage standpoint and, of course, are higher than are asked of the so-called preferential buyers. Some local fabricators have had a very good week in awards, and all are figuring on a fair amount of new work. It is also a unanimous report that prices on fabricated steel are highly competitive.

**Plates.**—It has been a good week for local barge builders, who have booked 24 of them, taking almost 3600 tons of plates and small shapes. The awards include 20 additional barges for the Inland Waterways Corporation for use by the upper Mississippi River barge line, making a total of 45 lately placed, requiring about 7300 tons of steel. More large-diameter pipe for Western gas lines will help plate mill operations,

and there is a very fair amount of tonnage in day-to-day orders, which are numerous, if individually small. Prices still range from 1.80c. to 1.90c., base Pittsburgh, according to the tonnage and its destination, but locally 1.85c. to 1.90c. is the ruling market.

**Wire Products.**—Unfavorable weather has affected consumption of some products adversely, and this, coupled with a seasonal letdown in purchases by the agricultural districts, is seen in smaller business for the mills. But instead of growing weaker with lighter demands, the market is developing resistance to price pressure, since there is more general recognition of the fact that prices alone will not create business. It is reported that some low prices recently current in the Northwest have been withdrawn, and the situation in some other competitive districts is said to be no worse than it has been. The local market, by comparison with some others, has been making a good showing as to prices.

**Rails and Track Supplies.**—Current demands for rails and track accessories are light, and as yet not much interest is apparent in supplies for the third and fourth quarters of the year. Sales of light-section rails are still limited by the low rate of soft coal mine operations. Prices are steady but untested.

**Tubular Goods.**—While there is little cheer in the business reports of pipe makers, the market as a whole has not made so bad a showing for the year to date as might be supposed from the fact that oil country demands for well pipe have been as small this year as they were large last year. The total shipments of all kinds of pipe have not been more than 10 per cent smaller than they were in the same period last year, and the loss in standard-weight pipe has been even less than that. An increase in the shipments of large-diameter pipe for gas pipe lines has to a large extent made up the loss of oil well pipe tonnage. More line pipe business of size has been placed lately, the leading producer having taken an order for 100 miles of 16-in. and 60 miles of 12½-in. pipe for the Prairie Pipe Line Co., while an order for 300 miles of 22-in. pipe, presumably for the gas line from Amarillo, Tex., to Denver, is reported to have gone to the A. O. Smith Corporation, Milwaukee. Boiler tube business could be better, and mechanical tubing feels the slowing down in automobile production.

**Sheets.**—Automobile body sheets, which require more time in production than the common finishes, are beginning to be wanted for shipment after July 1, and a test of the higher prices announced about a month ago has come first in that grade. Manufacturers have won, and body sheets now are squarely quotable at 4.25c., base Pittsburgh, at which several fair-sized sales have been made and to consumers who usually get concessions, if any are made. The demand is still light for the common finishes, as buyers generally had a chance to cover their needs up to the end of this month before prices went up, but there are a good many requirements that they could not anticipate and on these they have to pay the full quotations. The general market can be described as quiet but firm.

**Tin Plate.**—If actual orders for last half tonnages do not amount to much, at least manufacturers have

## THE IRON AGE Composite Prices

### Finished Steel June 7, 1927, 2.374c. a Lb.

One week ago.....	2.374c.
One month ago.....	2.353c.
One year ago.....	2.410c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.	Jan. 4:	2.339c.	April 26
1926	2.453c.	Jan. 5:	2.403c.	May 18
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14
1923	2.824c.	April 24:	2.446c.	Jan. 2

### Pig Iron June 7, 1927, \$19.07 a Gross Ton

One week ago.....	\$19.07
One month ago.....	19.13
One year ago.....	20.13
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	\$19.71,	Jan. 4:	\$18.96,	Feb. 15
1926	21.54,	Jan. 5:	19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7
1924	22.88,	Feb. 26:	19.21,	Nov. 3
1923	30.86,	March 20:	20.77,	Nov. 20



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.85c. to 1.90c.
F.o.b. Chicago.....	2.00c.
Del'd Philadelphia.....	2.12c. to 2.17c.
Del'd New York.....	2.14c. to 2.19c.
Del'd Cleveland.....	2.04c.
F.o.b. Cleveland.....	1.85c. to 1.90c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Cif. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.90c.
F.o.b. Birmingham.....	2.00c.

### Rail Steel

F.o.b. mill.....	1.70c. to 1.80c.
F.o.b. Chicago.....	1.90c.

### Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

### Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	1.95c. to 2.05c.
Del'd Cleveland.....	1.99c. to 2.04c.
Del'd Philadelphia.....	2.07c. to 2.17c.
Del'd New York.....	2.09c. to 2.19c.
Cif. Pacific ports.....	2.25c. to 2.30c.

### Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	1.99c. to 2.04c.
Del'd Philadelphia.....	2.02c. to 2.17c.
Del'd New York.....	2.04c. to 2.19c.
Cif. Pacific ports.....	2.35c.

### Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.30c.
All gages, 6 in. to 12 in., P'gh.....	2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net.....	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net.....	2.40c.
All gages, narrower than 6 in., Chicago, 2.40c. to 2.60c.	
All gages, 6 in. and wider, Chicago, 2.30c. to 2.50c.	

\*Mills follow plate or sheet prices according to gage on wider than 14 in.

### Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.40c.
Bars, f.o.b. Chicago.....	2.40c.
Bars, Cleveland.....	2.35c.
Shafting, ground, f.o.b. mill.....	2.55c. to 3.00c.
Strips up to 12 in., f.o.b. Pittsburgh mill.....	3.00c. to 3.25c.
Strips up to 12 in., f.o.b. Cleveland mills.....	3.00c. to 3.25c.
Strips up to 12 in., delivered Chicago.....	3.30c. to 3.55c.
Strip sheets, 12 in. and wider, Pittsburgh mill.....	3.00c.
Strip sheets, 12 in. and wider, Cleveland mill.....	3.00c.
Strip sheets, 12 in. and wider, Chicago mill.....	3.30c.

\*According to size.

### Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.50
Galv'd nails.....	4.50
Galvanized staples.....	3.20
Polished staples.....	2.95
Cement coated nails.....	2.50

	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	\$2.45 to 2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	3.20
Barbed wire, painted.....	2.95

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

### Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

## Sheets

### Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.35c.
Nos. 9 and 10, del'd Philadelphia.....	2.57c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.35c. to 2.45c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	3.00c.
No. 24, f.o.b. Ch'go dist. mill.....	3.10c.
No. 24, del'd Philadelphia.....	3.32c.
No. 24, f.o.b. Birmingham.....	3.10c. to 3.15c.

### Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	4.10c.
No. 24, f.o.b. Pittsburgh, B grade.....	4.00c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.85c.
No. 24, f.o.b. Chicago dist. mill.....	3.95c.
No. 24, del'd Philadelphia.....	4.17c.
No. 24, f.o.b. Birmingham.....	3.95c. to 4.05c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.10c.
No. 28, f.o.b. Chicago dist. mill.....	3.20c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.25c.
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### Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.20c. to 4.30c.
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### Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind. 5.60	

### Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100.....	20-lb. coating I.C. \$16.20
lb. base.....\$11.40	25-lb. coating I.C. 17.90
8-lb. coating I.C. 11.70	30-lb. coating I.C. 19.45
15-lb. coating I.C. 14.85	40-lb. coating I.C. 21.65

### Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series	Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon).....		\$3.00 to \$3.15
2300 (3 1/2% Nickel).....		4.30 to 4.40
2500 (5% Nickel).....		3.80 to 3.40
3100 (Nickel Chromium).....		4.75 to 5.00
3200 (Nickel Chromium).....		7.00 to 7.25
3300 (Nickel Chromium).....		6.25 to 6.50
3400 (Nickel Chromium).....		3.80 to 3.40
5100 (Chromium Steel).....		7.00 to 7.50
5200* (Chromium Steel).....		4.20 to 4.30
6100 (Chrom. Vanadium bars).....		3.80
6100 (Chrom. Vanad. spring steel).....		3.20 to 3.25
9250 (Silicon Manganese spring steel).....		4.10 to 4.20
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....		4.20 to 4.30
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.).....		4.20 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.).....		4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....		3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....		4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

## Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.00 to 38.00

## Track Equipment

### (F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 1/2 in. and larger.....	\$2.80 to \$3.00
Spikes, 1/2 in. and smaller.....	2.80 to 3.15
Spikes, boat and barge.....	3.25
Tie plates, steel.....	2.35
Angle bars.....	2.75
Track bolts, 1 1/2 in. and 1 in.....	3.90 to 4.90
Track bolts, 3/4 in. and smaller, per 100 count.....	70 per cent off list

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Inches	Steel Black	Galv.	Iron Black	Galv.
1/4.....	45	19 1/2	1/4 to 3/8..	+11 +39
1/2.....	51	25 1/2	1/2.....	22 2
3/4.....	56	42 1/2	3/4.....	28 11
1.....	60	48 1/2	1 to 1 1/2..	30 13
1 to 3.....	62	50 1/2		

### Lap Weld

2.....	55	43 1/2	2.....	23 7
2 1/2 to 6..	59	47 1/2	2 1/2.....	26 11
7 and 8..	56	43 1/2	3 to 6....	28 13
9 and 10..	54	41 1/2	7 to 12...	26 11
11 and 12.	53	40 1/2		

### Butt Weld, extra strong, plain ends

1/4.....	41	24 1/2	1/4 to 3/8..	+19 +54
1/2 to 3/4..	47	30 1/2	1/2.....	21 17
3/4.....	53	42 1/2	3/4.....	28 12
1.....	58	47 1/2	1 to 1 1/2..	30 14
1 to 1 1/2..	60	49 1/2		
2 to 3....	61	50 1/2		

### Lap Weld, extra strong, plain ends

2.....	53	42 1/2	2.....	23 9
2 1/2 to 4..	57	46 1/2	2 1/2 to 4..	29 15
4 1/2 to 6..	56	45 1/2	4 1/2 to 6..	28 14
7 to 8....	52	39 1/2	7 to 8....	21 15
9 and 10..	45	32 1/2	9 to 12...	16 2
11 and 12.	44	31 1/2		

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....	27 1 1/2 in.....+18
2 1/2 to 2 3/4 in.....	37 1 1/2 to 1 3/4 in.....+ 8
3 in.....	40 2 to 2 1/4 in.....— 2
3 1/2 to 3 3/4 in.....	42 1/2 2 1/2 to 3 in.....— 7
4 to 13 in.....	46 3 1/2 to 4 1/2 in.....— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

### Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.....	60 3 in..... 46
1 1/4 to 1 1/2 in.....	52 3 1/2 to 3 3/4 in..... 47
1 3/4 in.....	36 4 in..... 50
2 to 2 1/4 in.....	31 4 1/2, 5 and 6 in.. 48
2 1/2 to 2 3/4 in.....	39

### Hot Rolled

2 and 2 1/4 in....	37 3 1/2 and 3 3/4 in.. 53
2 1/2 and 2 3/4 in..	45 4 in..... 56
3 in.....	51 4 1/2, 5 and 6 in.. 51

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

### Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

contracts for that period well lined up and in no case is the price any lower than on first half contract tonnages, while in not a few cases on small-lot business makers have succeeded in reducing the preferential from the base price. The last half of the year rarely produces as much tonnage as the first half, and the market is reflecting to some degree the uncertainty there is about the pack of fruits and vegetables, due to the heavy and constant rains over much of the country during May.

**Cold-Finished Steel Bars and Shafting.**—Orders individually are materially smaller than they were recently, but there has been no shrinkage numerically and everything ordered is wanted so promptly as to suggest that consumers' stocks are moderate. The automotive industry is piecing out, rather than adding to, its inventories just now, with one season drawing to a close and another only a month or two away. The market remains quotable at 2.40c., Pittsburgh, for ordinary tonnages and at 2.30c. for large lots.

**Steel and Iron Bars.**—Orders and specifications for steel bars still run to small tonnages for prompt shipment and are numerous enough to provide a fairly full engagement of mill capacity, but they also mean frequent changing of rolls, and scheduling is a real problem. The best demand is from makers of cold-finished bars, but that comprises specifications on contracts rather than new business. The Pittsburgh district market is holding at 1.90c., base Pittsburgh, on ordinary lots, but that price is not obtainable in competitive markets, particularly in the East, where even 1.85c., Pittsburgh, is high by comparison with what some Eastern mills are quoting.

**Hot-Rolled Flats.**—New business in strips is still light, but the warning by manufacturers that tonnage on contract for second quarter shipment not specified by June 15 would be cancelled is stimulating releases and some makers report increased mill operations. Order books, however, are shrinking.

**Cold-Rolled Strips.**—At least two automobile builders have placed business at the new quotations, and makers now believe that they will have little trouble in writing third quarter contracts at 3.25c., base Pittsburgh or Cleveland, for lots of 1 to 3 tons, subject to graduated deductions for larger quantities. Unshipped second quarter tonnages, written at lower prices, are being ordered out steadily.

**Bolts, Nuts and Rivets.**—Specifications on contracts for bolts and nuts are rather slow, and new business is of moderate proportions. Buyers usually defer specifications on contracts when higher prices are ahead, and with the April 1 list likely to have general application on third quarter contracts, there is a tendency to try to carry over some of the lower-priced second quarter purchases. Large rivets are holding at the April 1 price on new business.

**Coke and Coal.**—Spot furnace coke is slightly firmer, but only to the extent that freshly drawn coke is having less competition from loaded cars. There are fewer sales than was the case recently at less than

\$2.90 per net ton at ovens. A Buffalo steel maker recently contracted for the third quarter requirements of one furnace and is understood to have paid \$3.50, the contract containing the wage clause, which will mean much less in the event of a restoration of the Nov. 19 wage scale, which some in the trade regard as likely. Other pig iron producers who are not covered on coke for the third quarter are talking of \$3 as the maximum price they can afford to pay on the basis of present prices of pig iron, and it is reported that some coke producers have quoted \$3.25 with or without the wage clause. Spot foundry coke holds at its recent prices and a fair amount of third quarter contracting is reported, with the specially prepared brands quoted at \$5 to \$5.35. The coal market shows no gain in activity or strength. Pittsburgh district operators are making an effort to get the Interstate Commerce Commission to modify its Lake cargo rate decision by making the 20c. reduction effective immediately instead of on Aug. 10, as stipulated in the decision.

**Old Material.**—Dealers here are getting more hold-ups than orders, and prices are no stronger than they have been. In the steel works grades, prices receive a measure of support from a shortage against sales at one point in the district of about 20,000 to 25,000 tons, but new consumer buying is lacking and offers of heavy melting steel at \$15.50 find no takers. If mills wanted a tonnage, they would not be able to buy for less, but at the moment the principal demand is from dealers, who will not pay more than \$15 to \$15.25. Blast furnace scrap is being taken by one consumer at \$11, but only limited quantities are salable at that figure, while dealers are not paying more than \$10.50.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel .....	\$15.00 to \$15.50
Scrap rails .....	14.50 to 15.00
Compressed sheet steel .....	14.00 to 14.50
Bundled sheets, sides and ends .....	13.00 to 13.50
Cast iron car wheels .....	15.50 to 16.00
Sheet bar crops, ordinary .....	16.00 to 16.50
Heavy breakable cast .....	14.00 to 14.50
No. 2 railroad wrought .....	15.50
Heavy steel axle turnings .....	14.00 to 14.50
Machine shop turnings .....	10.50 to 11.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers ..	17.00 to 17.50
Railroad coil and leaf springs ..	17.00 to 17.50
Rolled steel wheels .....	17.00 to 17.50
Low phosphorus billet and bloom ends .....	20.00 to 20.50
Low phosphorus, mill plate .....	19.50 to 20.00
Low phosphorus, light grade .....	17.00 to 17.50
Low phosphorus sheet bar crops ..	19.00 to 19.50
Heavy steel axle turnings .....	14.00 to 14.50
Electric Furnace Grades:	
Low phosphorus punchings .....	18.00 to 18.50
Heavy steel axle turnings .....	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings ..	10.50 to 11.00
Short mixed borings and turnings ..	10.50 to 11.00
Cast iron borings .....	10.50 to 11.00
No. 2 busheling .....	10.50 to 11.00
Rolling Mill Grades:	
Steel car axles .....	20.50 to 21.00
No. 1 railroad wrought .....	12.50 to 13.00
Cupola Grades:	
No. 1 cast .....	15.50 to 16.00
Rails 3 ft. and under .....	18.00 to 18.50
Malleable Grades:	
Railroad .....	15.50
Industrial .....	15.00
Agricultural .....	14.50

#### Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes ..	2.90c.
Reinforcing steel bars .....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons .....	3.60c.
Squares and flats .....	4.10c.
Bands .....	3.60c. to 3.65c.
Hoops .....	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles .....	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles .....	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets .....	3.30c.
Spikes, large .....	3.30c. to 3.40c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Track bolts, ¾ in. and smaller, per 100 count, 62½ per cent off list	
Machine bolts, per 100 count, 62½ per cent off list	
Carriage bolts, per 100 count, 62½ per cent off list	
Nuts, all styles, per 100 count, 62½ per cent off list	
Large rivets, base per 100 lb. ....	\$3.50
Wire, black soft annealed, base per 100 lb. ....	2.90
Wire, galvanized soft, base per 100 lb. ....	2.90
Common wire nails, per keg. ....	\$2.80 to 2.90
Cement coated nails, per keg. ....	2.85 to 2.95

#### Detroit Scrap Prices Unchanged

DETROIT, June 7.—Indications are that the melt in this district for the month will be above that of May, due to the fact that changes for the new automobile models have been completed and are now in full foundry production. No interest has yet been shown in third quarter pig iron requirements, but most melters will be forced to buy within the next 30 days. There have been no changes in scrap prices.

	Per Gross Ton
Heavy melting and shoveling steel .....	\$12.50 to \$13.00
Borings and short turnings .....	8.25 to 8.75
Long turnings .....	7.50 to 8.00
No. 1 machinery cast .....	17.00 to 18.00
Automobile cast .....	19.00 to 20.00
Hydraulic compressed .....	11.00 to 11.50
Stove plate .....	13.50 to 14.50
No. 1 busheling .....	10.50 to 11.00
Sheet clippings .....	8.00 to 8.50
Flashings .....	10.50 to 11.00



# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

### Billets and Blooms

	Per Gross Ton
Re-rolling, 4-in. and over.....	\$33.00
Re-rolling, under 4-in. to and including 1 1/4-in. ....	\$33.50 to 34.00
Forging, ordinary .....	39.00 to 40.00
Forging, guaranteed .....	44.00 to 45.00

### Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$33.50 to \$34.00

### Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in. ....	\$33.50 to 34.00

### Skelp

	Per Lb.
Grooved .....	1.80c. to 1.90c.
Sheared .....	1.80c. to 1.90c.
Universal .....	1.80c. to 1.90c.

### Wire Rods

	Per Gross Ton
*Common soft, base.....	\$42.00 to \$43.00
Screw stock .....	\$5.00 per ton over base
Carbon 0.20% to 0.40% .....	3.00 per ton over base
Carbon 0.41% to 0.55% .....	5.00 per ton over base
Carbon 0.56% to 0.75% .....	7.50 per ton over base
Carbon over 0.75% .....	10.00 per ton over base
Acid .....	15.00 per ton over base

\*Chicago mill base is \$42.50 to \$44. Cleveland mill base, \$42 to \$43.

## Prices of Raw Materials

### Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria.....	10.50c.
Iron ore, Swedish, average 66% iron.....	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50% .....	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates .....	\$11.00 to \$11.50
Chrome ore, Indian basic, 48% Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard.....	\$22.50
Molybdenum ore, 85% concentrates of MoS <sub>3</sub> , delivered .....	50c. to 55c.

### Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid .....	90.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21% .....	\$36.00 to \$37.00
Domestic, 16 to 19% .....	36.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% .....	\$85.00 to \$87.50
75% .....	145.00
	Per Gross Ton Furnace
10% .....	\$35.00
11% .....	37.00
	Per Gross Ton Furnace
12% .....	\$39.00
14 to 16% .....	\$45 to 46.00

### Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
10% .....	\$34.00
11% .....	36.00
12% .....	\$38.00

### Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
6% .....	\$26.50
7% .....	27.50
8% .....	28.50
9% .....	30.00
10% .....	\$32.00
11% .....	34.00
12% .....	36.00

### Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd .....	\$1.00 to \$1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace .....	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton .....	\$122.50

### Fluxes and Refractories

#### Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00 to \$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	\$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

#### Fire Clay

	Per 1000 f.o.b. Works
First Quality	Second Quality
Pennsylvania .....	\$43.00 to \$46.00
Maryland .....	43.00 to 46.00
New Jersey .....	50.00 to 65.00
Ohio .....	43.00 to 46.00
Kentucky .....	43.00 to 46.00
Missouri .....	43.00 to 46.00
Ground fire clay, per ton .....	7.00

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$43.00
Chicago .....	52.00
Birmingham .....	50.00
Silica clay, per ton.....	\$8.50 to 10.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa. ....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa. ....	40.00

#### Chrome Brick

	Per Net Ton
Standard size .....	\$45.00

### Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt .....	\$2.90 to \$3.00
Foundry, f.o.b. Connellsville prompt .....	4.00 to 4.50
Foundry, by-product, Ch'go ovens .....	9.75
Foundry, by-product, New England, del'd .....	12.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.59 to 10.77
Foundry, Birmingham .....	5.50 to 6.00
Foundry, by-product, St. Louis.....	10.25

### Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines .....	\$1.30 to \$1.90
Mine run coking coal, f.o.b. W. Pa. mines .....	1.70 to 1.90
Mine run gas coal, f.o.b. Pa. mines .....	2.00
Steam slack, f.o.b. W. Pa. mines.....	1.25
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

*Machine bolts .....	70
*Carriage bolts .....	70
Lag bolts .....	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square.....	70
Hot-pressed nuts, blank or tapped, hexagon.....	70
C.p.c. and t. square or hex. nuts, blank or tapped .....	70
Washers* .....	6.75c. to 6.50c. per lb. off list

\*F.o.b. Chicago and Pittsburgh. †Bolts with rolled threads up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

### Bolts and Nuts

Per Cent Off List

Semi-finished hexagon nuts.....	70
Semi-finished hexagon castellated nuts, S.A.E.....	70
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2 1/2
Tire bolts .....	60 and 5

### Large Rivets

(1/2-In. and Larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....	\$2.75
F.o.b. Chicago .....	2.35

### Small Rivets

(1/4-In. and Smaller)

Per Cent Off List

F.o.b. Pittsburgh .....	70, 10 and 5
F.o.b. Cleveland .....	70, 10 and 5 to 70 and 10
F.o.b. Chicago .....	70, 10 and 5 to 70 and 10

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws.....	80, 10 and 10
Milled standard set screws, case hardened.....	80 and 10
Milled headless set screws, cut thread.....	85 and 5
Upset hex. head cap screws, U.S.S. thread.....	85 and 5
Upset hex. cap screws, S.A.E. thread.....	85 and 5
Upset set screws.....	80, 10 and 10
Milled studs .....	70 and 5



# Chicago

## Illinois Central Buys 4500 Cars — New Business in Steel Tapering

CHICAGO, June 7.—The Illinois Central has ordered 4500 freight cars, requiring close to 60,000 tons of steel, and 15 eight-wheel switching locomotives. Specifications and new business in track accessories are in larger volume, and a round tonnage of standard-section rails is being quietly added to contracts placed last fall.

Fabricators are holding stocks to the minimum, and when deliveries from mills are not satisfactory on small and mixed orders shops resort to borrowing from each other. All told, business in steel is dragging, practically all lines being affected, and production is definitely seeking lower levels. New buying in finished steel is dropping sharply, and specifications are falling short of shipments. The Steel Corporation has blown out the No. 2 stack at Gary, thereby reducing the number of active steel works blast furnaces in this district to 29 out of 36.

Purchases, specifications and shipments at Chicago mills in the first five months of this year were practically equal to those for the corresponding period of 1926.

**Pig Iron.**—Several 1000-ton lots of Northern iron have been placed for third quarter delivery. As a general rule, however, there are no indications of a concerted buying movement, orders usually being placed quietly and without open competition. Spot buying is more active, giving rise to the belief in some quarters that many melters are too intent on watching the uncertain trend of business to make commitments as far as two or three months in advance. Quotations on prospective business and on current orders are at \$20, base Chicago furnace. A Milwaukee melter is in the market for 500 tons of low phosphorus iron. Silvery is moving only in carloads, and the price schedule is being closely adhered to.

### Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.00
Silvery, sil. 8 per cent.	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered at consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferroalloys.**—Outside of several carlot orders for ferromanganese at \$90, seaboard, this market is listless. No sales of ferrosilicon are reported, but as yet there has been little or no recession in specifications.

Prices delivered Chicago: 80 per cent ferromanganese, \$97.56; 50 per cent ferrosilicon, \$85 to \$87.50; spiegeleisen, 18 to 22 per cent, \$42.56 to \$43.76.

**Plates.**—Sales are in smaller volume than a week ago, particularly in outlying territory where Eastern mills, with a price at Pittsburgh \$3 a ton lower than the level being maintained in Chicago, are able to press the freight equalization line closer to local mills. Oil storage projects that were active at the turn of the month appear to have been laid aside, and no fresh inquiry for tanks has developed. In the railroad equipment market the Chicago & Illinois Midland has placed 350 hopper cars, the St. Joseph Lead Co., 350 mine cars, and the Illinois Central, a total of 4500. No definite information has come out concerning business that may develop from the Chicago, Burlington & Quincy and the Chicago & North Western.

Mill prices on plates per lb.: 2c., Chicago.

**Structural Material.**—Structural awards are more numerous, business placed this week having totaled 4500 tons. Outstanding among the awards was 1900 tons for a power house at Pekin, Ill., and 1550 tons for bridges across the Illinois Central tracks in Chicago. Six hundred fifty tons was taken in three lots by small

fabricators, whose capacity is such that current business does not warrant operations above 50 per cent. Figures now available indicate that Chicago building construction for the first five months of this year was larger than in any similar period in the past six years. Building in the first five months of 1927 led the corresponding period of 1926 by 18 per cent. From the viewpoint of building by months it now develops that May was not so good as April, and it is rather generally believed that June will not hold the pace of last month.

Mill prices on plain material per lb.: 2c., Chicago.

**Bars.**—The demand for soft steel bars is slackening. Buyers are pursuing a cautious policy and are closely watching the price situation. Lower prices in the East have resulted in a reduction in the territory ordinarily tributary to Chicago mills. Producers feel that the potential demand has not changed materially, and they are making efforts to maintain Chicago prices at 2c. Business from the automobile trade has been shifting considerably, but in the main the total volume of specifications remains steady and June schedules of motor car builders indicate a maintenance of the present rate of output until the end of the month. The drop in bar demand is limited principally to agricultural machinery manufacturers and miscellaneous users of bars.

Mill prices per lb.: Soft steel bars, 2c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c. Chicago.

**Rails and Track Supplies.**—Several railroads, including the Southern Pacific, are making inquiry for a total of 25,000 kegs of spikes and bolts, the bulk of which will go to Eastern and Southern mills. Production of track accessories in this district is still pointing upward, some departments now being at 100 per cent of capacity while others are dragging at 60 per cent. Three small purchases of standard-section rails total 1500 tons, and it is reported that an inquiry has developed at St. Louis for 5000 tons. It is generally believed that the Chesapeake & Ohio will soon come into the market for rails, the tonnage being placed at 20,000. Specifications for rails are in smaller volume, and production has dropped about 3 per cent, or to 77 per cent of rated capacity.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36 to \$38. Per lb.: Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

**Sheets.**—Prices in Chicago are steady, though both sales and specifications show a slight drop. Producers have not as yet announced third quarter prices, and they are showing some hesitancy in booking beyond the first part of July. Orders for roofing and siding material from the South are more numerous, and jobbers report that the credit situation in that section is rapidly improving. Production remains at close to 85 per cent of capacity, although rolling schedules are dependent on the order mails of each week.

Prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

**Cast Iron Pipe.**—Fresh inquiry from public utilities and private buyers is noticeably more active, but municipalities in this territory are showing some hesitancy in making known their requirements for July and August. Dealers believe that there is a substantial tonnage of pipe to be purchased for summer shipment and point to the unseasonable weather as the primary obstacle to the placing of expected business. While bookings have been heavier in certain sizes of pipe than in others, foundry schedules are said to be well balanced and current shipments are not materially changing this favorable operating condition. Prices are holding well at \$35, Birmingham, for 6-in. and larger diameters, but it is becoming increasingly difficult to obtain more than \$35.50 on small orders. Incoming business does not balance shipments, and deliveries on all sizes can now be made in about 30 days. The United States Cast Iron Pipe & Foundry Co. is said to be low bidder at \$33.55, base Birmingham, or \$41.50, delivered, on 3000 tons of 36-in. pipe for Detroit. It is reported that Detroit will place 3800 tons of 16-in. pipe with the United States company and

that 3600 tons of 12-in. Class C pipe will be distributed equally among the American Cast Iron Pipe Co., the National Cast Iron Pipe Co. and the United States company. Metamora, Ohio, has awarded 100 tons of 6 and 8-in. Class B pipe to the National Cast Iron Pipe Co. at \$35. base Birmingham, and Chicago has placed 200 tons of 3-in. to 24-in. fittings with the American Cast Iron Pipe Co. The United States company has taken 100 tons of 6-in. Class C pipe for Marshfield, Wis., and J. M. Brooks, Detroit, has been awarded the general contract for 350 tons of 4, 6 and 8-in. pipe for Green Springs, Ohio.

Prices per net ton, delivered Chicago: Water pipe, 4-in. and over, \$43.20 to \$43.70; 4-in., \$47.20 to \$47.70; Class A and gas pipe, \$4 extra.

**Reinforcing Bars.**—Contracts for reinforcing bars have been numerous, totaling close to 2200 tons for the week. Of special note are the Ribach Building, Chicago, calling for 900 tons, and an apartment building that requires 480 tons. The general contract has been awarded for an office building at 333 North Michigan Avenue, for which 550 tons of reinforcing bars will be needed. Fresh inquiry is slower. Contracts let since the first of the year for hard steel reinforcing bars for Illinois State roads, culverts and bridges total 5000 tons. Weakness in prices noted a week ago is still in evidence, and on the whole the market is off \$2 a ton. Current quotations on billet steel reinforcing bars out of Chicago warehouses range from 2.29c. to 2.65c. per lb., and prices for rail steel bars are not above 2c. for large lots and 2.45c. for orders of 10 tons and less.

**Bolts, Nuts and Rivets.**—Specifications, particularly for bolts and nuts, are lighter, though this may be accounted for in part by the fact that there were only four and one-half working days last week. Small rivets are in good demand, with prices holding well. Reports indicate that third quarter contracts will be prepared next week at the present schedules.

**Wire Products.**—Producers have announced fall terms on woven wire fencing and fence posts, and buying of these commodities is showing marked improvement. Poultry netting is being taken in large quantities, and mills are running behind on orders for some sizes. The demand for nails in and close to Chicago is dull, but shipments to the West and Northwest are still in good volume. No improvement is noted in the price of wire nails, common quotations being \$2.55 to \$2.60, Chicago.

**Old Material.**—The market has given further ground, and prices have dropped to lower levels. A consumer has purchased 5000 tons of cast iron borings at \$10 per gross ton, delivered, and users of railroad malleable have taken tonnages at \$14 per gross ton, delivered. Several lots of steel angle bars have been sold down to \$13.50. Lower prices have temporarily halted the inflow of country scrap, leaving dealers with the one problem of disposing of railroad scrap, shipments which have held at a uniform rate for several months. Consumption well matches the tonnage forwarded by the railroads, and from all reports little or no scrap has been placed on the ground. Heavy melting steel, which was offered freely at \$12.75 per gross ton, de-

livered, a week ago, is now not above \$12.50, and mills are still holding out of the market, notwithstanding that contracts on the whole are nearing completion.

Prices delivered consumers' yards, Chicago:  
Per Gross Ton

Basic Open-Hearth Grades	
Heavy melting steel.....	\$12.00 to 12.50
Shoveling steel.....	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails.	13.00 to 13.50
Hydraulic compressed sheets.....	10.00 to 10.50
Drop forge flashings.....	9.25 to 9.75

Acid Open-Hearth Grades	
Forged, cast and rolled steel car-wheels.....	14.25 to 14.75
Railroad tires, charging box size.	14.50 to 15.00
Railroad leaf springs, cut apart..	14.50 to 15.00
Steel couplers and knuckles.....	14.25 to 14.75
Coil springs.....	14.75 to 15.25
Low phosphorus punchings.....	14.50 to 15.00

Electric Furnace Grades	
Axle turnings.....	11.50 to 12.00

Blast Furnace Grades	
Axle turnings.....	9.75 to 10.25
Cast iron borings.....	9.50 to 10.00
Short shoveling turnings.....	9.50 to 10.00
Machine shop turnings.....	6.75 to 7.25

Rolling Mill Grades	
Iron rails.....	13.50 to 14.00
Rerolling rails.....	14.75 to 15.25

Cupola Grades	
Steel rails, less than 3 ft.....	15.00 to 15.50
Angle bars, steel.....	13.00 to 13.50
Cast iron carwheels.....	13.50 to 14.00

Malleable Grades	
Railroad.....	13.50 to 14.00
Agricultural.....	13.50 to 14.00

Miscellaneous	
*Relaying rails, 56 to 60 lb.....	25.50 to 26.50
*Relaying rails, 65 lb. and heavier	26.00 to 31.00

Per Net Ton	
Rolling Mill Grades	
Iron angle and splice bars.....	13.50 to 14.00
Iron arch bars and transoms.....	18.50 to 19.00
Iron car axles.....	20.00 to 20.50
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	10.50 to 11.00
No. 1 busheling.....	9.25 to 9.75
No. 2 busheling.....	6.00 to 6.50
Locomotive tires, smooth.....	13.75 to 14.25
Pipes and flues.....	7.00 to 7.50

Cupola Grades	
No. 1 machinery cast.....	14.50 to 15.00
No. 1 railroad cast.....	13.50 to 14.00
No. 1 agricultural cast.....	13.25 to 13.75
Stove plate.....	12.50 to 13.00
Grate bars.....	11.50 to 12.00
Brake shoes.....	10.00 to 10.50

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

## Ford Company Proposes Radical Change in Method of Buying Sheets

A radical change in the method of buying sheet steel has been proposed by the Ford Motor Co., Detroit, to some of the sheet mills, which now have it under consideration. It is the common practice for mills to supply sheets ¼ in. to ½ in. wider and 1 in. to 2 in. longer than required for the blanks for which they are ordered, and the consumer pays for all the excess material, which is converted into scrap. The Ford company proposes that the mills absorb 50 per cent of this overage, or in other words that the tonnage it pays shall be an average of the weight if cut exactly to size and the actual weight.

The Ford company also proposes that for the present method of billing sheets according to actual weight there be substituted weights based on the weight per sheet for each gage figured from the weight per cubic inch of steel determined by density and specific gravity. At present, sheet weights per square foot for the various gages are figured on United States standards and these standards are based on the weight of iron.

Under the proposed plan there would be a definite fixed weight and price for each sheet of a size and gage. While the usual tolerance in thickness would remain in effect, the cost would be the same whether the sheet exceeds or falls below the specified gage thickness. The advantage of the proposed change as claimed by the Ford company is that, having the exact cost of material for each blank, the cost of manufacturing a part can be figured much more closely than when the sheets are bought on a strictly tonnage basis.

## Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.20c. to 2.65c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands.....	3.65c.
Hoops.....	4.15c.
Black sheets (No. 24).....	3.95c.
Galvanized sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	4.50c.
Spikes, standard railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
	Per Cent Off List
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, squares, tapped or blank..	60
Hot-pressed nuts, hexagons, tapped or blank..	60
No. 8 black annealed wire, per 100 lb.....	\$3.20
Common wire nails, base per keg.....	\$2.85 to 2.95
Cement coated nails, base per keg.....	2.95



## New York

### Inquiry for Pig Iron Improves—Plates, Shapes and Bars Weaken

NEW YORK, June 7.—Sales of pig iron by local brokers during the past week totaled barely 5000 tons, but with foundry melt increasing and with more interest being shown in forward requirements, the market has a better tone. Improved foundry operations, particularly among jobbing plants, are reflected in a marked decline in holdup orders and in releases against previous suspensions. A group of jobbing foundries in northern New Jersey, which operated at an average of 53 per cent in April and May, is now running at a 10 to 15 per cent better rate, according to current reports. While the trade still feels that considerable iron bought for this quarter will be carried over into third quarter, a number of good-sized inquiries for extended shipment have appeared. The Eastern Malleable Iron Co., Naugatuck, Conn., is in the market for 2500 to 5000 tons of malleable for third quarter, and another melter is inquiring for 1000 tons of iron for delivery over the entire last half. The General Electric Co., Schenectady, N. Y., is asking for prices on 750 tons of foundry for June to October shipment to Pittsfield, Mass. The Davies & Thomas Co., New York, which is in the market for 1000 tons of special iron for delivery at Catsauqua, Pa., as previously noted, is expected to buy from 5000 to 10,000 tons. The Newport News Shipbuilding & Dry Dock Co. has closed against its inquiry for 600 tons of foundry and malleable for its Newport News, Va., works. The Richmond Radiator Co. has not yet taken action on its inquiry for 2000 to 3000 tons for Uniontown, Pa. A total of close to 15,000 tons of pig iron is now pending in this market. Pipe foundries on the Delaware River are taking iron at more or less regular intervals from eastern New York State producers, who are making shipment by sea-going barge. Prices are substantially unchanged.

#### Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail) .....	\$22.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn) .....	\$19.75 to 20.50
East. Pa. No. 2 fdy., sil. 1.75 to 2.25 .....	21.89 to 23.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75 .....	22.39 to 23.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25 .....	22.89 to 24.02
No. 2 Virginia fdy., sil. 1.75 to 2.25 .....	27.04

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania, \$5.54 from Virginia.

**Ferromanganese.**—A few small contracts for ferromanganese for the second half have been entered at \$90, seaboard. Consumers are taking very little active interest in the market, having in most instances a sufficient amount of ferromanganese due them on first half contracts to carry them well into the third quarter.

**Finished Steel.**—Diminishing demand for plates, shapes and bars has brought a weakening in prices of those forms of steel, amounting in each case to at least \$1 a ton. Steel bars have been sold at 1.80c., Pittsburgh, with 1.85c. applying on moderate size lots and 1.90c. now obtainable chiefly on less-carload lots. Plates have weakened to the extent that 1.80c., Pittsburgh, is being quite freely quoted for carload lots, with smaller lots frequently being sold at 1.85c., while on the larger tonnages 1.75c., Pittsburgh, has been done, and in a few exceptional cases, such as for structural steel fabrication, universal plates have been sold at 1.70c., or at the same price as shapes. Structural shapes are decidedly weaker, some of the larger buyers having succeeded in making purchases at 1.70c. and 1.75c., Pittsburgh, while 1.80c. and 1.85c., Pittsburgh, are now easily obtainable on the smaller lots. In the case of structural shapes a factor which has contributed to the gradual weakening of the market recently is the tendency of fabricators to bid low on structural work and then look to the mills for help in fulfilling their contracts without loss. Spirited competition on a number of structural jobs between Carnegie and

Bethlehem special sections has also developed. The lighter forms of steel are holding their market position more firmly than plates, shapes and bars. The real test of the new sheet prices is yet to come, but there has been some small business at the new schedule, and between now and the end of this month buyers, in filling their requirements for third quarter, will have to meet the apparent determination of the sheet mills to adhere to the present quotations. An oil company last week bought 400 tons of tin mill black plate, on which the results, so far as price is concerned, are unknown to those who failed to get a share of the business. Despite the continuance of the plumbers' strike in Brooklyn and the lockout in Manhattan, orders for merchant pipe are in slightly better volume. As a whole, the demand for finished steel products shows a marked tapering off so far this month.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c. to 2.24c.; plates, 2.09c. to 2.19c.; structural shapes, 2.04c. to 2.19c.; bar iron, 2.14c.

#### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes .....	3.34c.
Soft steel bars and small shapes .....	3.24c.
Iron bars .....	3.24c.
Iron bars, Swedish charcoal .....	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons .....	4.00c.
Flats and squares .....	4.50c.
Cold-rolled strip, soft and quarter hard .....	5.75c.
Hoops .....	4.49c.
Bands .....	3.99c.
Blue annealed sheets (No. 10 gage) .....	3.89c.
Long terne sheets (No. 24 gage) .....	5.80c.
Standard tool steel .....	12.00c.
Wire, black annealed .....	4.50c.
Wire, galvanized annealed .....	5.15c.
Tire steel, 1½ x ½ in. and larger .....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger .....	3.65c.
Open-hearth spring steel, bases .....	4.50c. to 7.00c.
Machine bolts, cut thread: Per Cent Off List	
¾ x 6 in. and smaller .....	50 to 50 and 10
1 x 30 in. and smaller .....	45 to 50
Carriage bolts, cut thread:	
½ x 6 in. and smaller .....	50 and 10 to 60
¾ x 20 in. and smaller .....	50 to 50 and 5
Coach screws:	
½ x 6 in. and smaller .....	50 and 10 to 60
1 x 16 in. and smaller .....	50 to 50 and 5
Boiler Tubes— Per 100 Ft.	
Lap welded steel, 2-in. .....	\$17.33
Seamless steel, 2-in. .....	20.24
Charcoal iron, 2-in. .....	25.00
Charcoal iron, 4-in. .....	67.00
Discounts on Welded Pipe	
Standard Steel—	Black Galv.
½-in. butt .....	46 29
¾-in. butt .....	51 37
1-in. butt .....	53 39
2½-6-in. lap .....	48 35
7 and 8-in. lap .....	44 17
11 and 12-in. lap .....	37 12
Wrought Iron—	
½-in. butt .....	4 +19
¾-in. butt .....	11 +9
1-1½-in. butt .....	14 +6
2-in. lap .....	5 +14
3-6-in. lap .....	11 +6
7-12-in. lap .....	3 +16

#### Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box .....	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC .....	\$9.70	\$12.10
IX .....	12.00	14.25
IXX .....	13.90	16.00

#### Terne Plate (14 x 20 in.)

IC—20-lb. coating .....	\$10.00 to \$11.00
IC—30-lb. coating .....	12.00 to 13.00
IC—40-lb. coating .....	13.75 to 14.25

#### Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20 .....	4.00c.
No. 22 .....	4.15c.
No. 24 .....	4.20c.
No. 26 .....	4.30c.
No. 28* .....	4.45c.
No. 30 .....	4.70c.

#### Sheets, Galvanized

	Per Lb.
No. 14 .....	4.35c. to 4.60c.
No. 16 .....	4.45c. to 4.70c.
No. 18 .....	4.60c.
No. 20 .....	4.75c.
No. 22 .....	4.80c.
No. 24 .....	4.95c.
No. 26 .....	5.20c.
No. 28* .....	5.45c.
No. 30 .....	5.85c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.



**Reinforcing Bars.**—The Concrete Steel Co. will furnish 450 tons of bars for three new sections of the New York municipal subway. The market has been unusually quiet during the last few days, particularly with respect to large jobs. Both old and new projects involving a considerable tonnage are likely to be placed at any time, and there is much road work both in southern New York and in New Jersey which will require a large aggregate of both bars and mesh. Prices are unchanged.

*Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 2.15c., delivered at job. Out of Youngstown warehouse, 2.50c., Youngstown, or 2.87½c., delivered New York.*

**Cast Iron Pipe.**—Purchasing continues to be confined to small lots, but most makers are well booked on the smaller sizes for the next 60 days or more. Prices are still irregular, depending upon the desirability of the tonnage under consideration and the known competition. The inquiry of the J. G. White Engineering Co., New York, for Rochester, N. Y., is still open, and the 1500 tons of pipe for Baranquilla, Colombia, has not yet been awarded. A general contract for about 1700 tons of pipe, mostly 12-in., is understood to have been awarded by the Department of Water Supply, Gas and Electricity, New York, to the F. P. Amato Co., New York.

*Prices per net ton, delivered New York: Water pipe 6-in. and larger, \$45.60 to \$47.60; 4-in. and 5-in., \$50.60 to \$52.60; 3-in., \$60.60 to \$62.60; Class A and gas pipe, \$5 extra.*

**Old Material.**—Buying prices of No. 1 heavy melting steel are unchanged at \$13.50 to \$14 per ton, delivered eastern Pennsylvania, but most other grades are off about 25c. per ton from last week's prices, except on shipments to Bethlehem, Pa. Cast borings are being purchased at \$10.50 per ton, delivered to a Birdsboro, Pa., consumer, and brokers filling contracts with a Phoenixville, Pa., plant are offering only \$9.50 per ton for machine shop turnings. Although heavy breakable cast is still being purchased at \$15.50 per ton, delivered to a Florence, N. J., foundry, brokers shipping to Claymont, Del., are offering only \$15 per ton, delivered. Forge fire is quotable at \$11 per ton, delivered, on a freight rate of \$3.52 per ton. While quotations on borings and turnings delivered to Bethlehem, Pa., are higher than to other mills in eastern Pennsylvania, brokers point out that as these are purchased under the new specifications of \$1 deduction for every 5 units of iron content less than 90 per cent, the actual net price to the shipper is usually no higher.

*Dealers' buying prices per gross ton, New York:*

No. 1 heavy melting steel.....	\$10.00 to \$11.35
Heavy melting steel (yard).....	7.50 to 7.75
No. 1 heavy breakable cast.....	11.25 to 12.50
Stove plate (steel works).....	7.50 to 8.50
Locomotive grate bars.....	9.00
Machine shop turnings.....	6.00 to 7.75
Cast borings (blast furnace or steel works).....	7.00 to 7.75
Mixed borings and turnings.....	7.00 to 7.75
Steel car axles.....	15.75 to 16.25
Iron car axles.....	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	8.75 to 9.25
Forge fire.....	7.50 to 8.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 yard wrought, long.....	10.50 to 11.00
Rails for rolling.....	11.00 to 11.50
Cast iron carwheels.....	11.00 to 11.50
Stove plate (foundry).....	8.75 to 10.00
Malleable cast (railroad).....	11.00 to 11.50
Cast borings (chemical).....	12.50 to 13.50

*Prices per gross ton, delivered local foundries:*

No. 1 machinery cast.....	\$15.00 to \$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to 14.00
No. 2 cast (radiators, cast boilers, etc.).....	12.50 to 13.00

**Warehouse Business.**—The usual decline in activity that appears about this season has not yet begun, and tonnage is moving out of stock at about the same rate as in May, the best month so far this year. Small lots of structural material are reported in demand, and there has been some purchasing of plates and blue annealed sheets. Black and galvanized sheets continue fairly firm, with occasional concessions reported. Bolts and screws are quiet, and anything larger than the usual purchase often brings out an additional 5 per cent discount from the established schedule.

**Coke.**—Contracting for third quarter and second half delivery continues, but current purchasing for spot shipment is small. Prices are substantially unchanged. Standard furnace is quoted at \$3 to \$3.25

per net ton, Connellsville, for prompt shipment, with medium sulphur coke as low as \$2.90, Connellsville. Standard foundry coke for prompt shipment is quoted at \$4.25 to \$4.75, Connellsville. Delivered prices of Connellsville foundry coke are: To northern New Jersey, \$8.28 to \$8.78; New York or Brooklyn, \$9.04 to \$9.54; Newark or Jersey City, N. J., \$8.16 to \$8.66 per net ton. By-product foundry coke continues at \$9.59 to \$10.77 per net ton, delivered Newark or Jersey City, N. J.

## Cleveland

### Heavier Sheet Buying by Automotive Industry—Pig Iron Weaker

CLEVELAND, June 7.—New demand for finished steel is light and the volume the past week was less than in the preceding week. Operations of some of the bolt, nut and rivet manufacturers and other consuming industries in this district have been curtailed. The seasonal slowing down of the automotive industry in Michigan is well under way, and some of the motor car manufacturers that are planning to bring out new models during the summer will curtail sharply this month. However, a few of the automobile companies are keeping close to recent production. Considerable business in sheets for the automotive industry for early shipment and the third quarter developed during the week, part of which has already been placed. Consumers in this territory are beginning to show some interest in contracts for steel bars, plates and structural material for the third quarter, but little, if any, business for that delivery has yet been placed and leading mills have not yet opened their books.

In the structural field fabricators are figuring on a good volume of work, the greater part of which is outside this immediate territory. An Ohio shop is figuring on a pipe line in New York requiring 3000 tons of plates.

The market shows an easier price tone on steel bars, plates and structural material. On plates and shapes 1.80c., Pittsburgh, has become a rather common quotation for good orders, with 1.85c. still being named for small lots. Contracts with some of the smaller plate consumers have been revised to 1.85c. On steel bars 1.85c., Pittsburgh, is the ruling price, and outside mills apparently are holding firmly to this quotation. The Cleveland mill price is unchanged at 1.85c. to 1.90c.

**Pig Iron.**—Buying for the third quarter continues in rather limited volume. Sales by Cleveland interests during the week aggregated 20,000 tons, or about the same as during the previous week. While some producers look for a good buying movement this month, others do not expect more than a moderate volume of business owing to the fact that many foundries will have enough iron due on second quarter contracts to carry them well into the next quarter. Activity is still centered in southern Ohio and Indiana. Little business is coming out in Cleveland and other points in northern Ohio or in Michigan. The local market lacks strength. For shipment to competitive points in outlying districts \$18, furnace, is the commonly quoted price on foundry and malleable iron, but some of the furnaces are going lower to absorb freight disadvantage. In the northern Ohio territory outside of Cleveland \$18.50,

### Warehouse Prices, f.o.b. Cleveland

	Base per lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.75c. to 3.00c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-rolled strip.....	5.95c.
Black sheets (No. 24).....	3.75c.
Galvanized sheets (No. 24).....	4.50c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.90
No. 9 galvanized wire, per 100 lb.....	3.35
Common wire nails, base, per keg.....	2.90

\*Net base, including boxing and cutting to length.

furnace, has been the ruling price for some time, but producers are now going to \$18, although they claim that they are still able to get \$18.50 in some cases. The Valley price is steady at \$18.50, furnace, but is untested on round-lot business. In Michigan the market is firm at \$19, furnace.

**Prices per gross ton at Cleveland:**

N'th'n No. 2 fdy., sil. 1.75 to 2.25.	\$19.50
Southern fdy., sil. 1.75 to 2.25...	24.00
Malleable .....	19.50
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	18.00
Standard low phos., Valley fur...	\$27.50 to 28.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

**Semi-Finished Steel.**—No new business is coming to Cleveland mills. Specifications are light for sheet bars and only fair for billets and slabs. Producers are talking of present prices for the third quarter, but no consumer interest in that delivery has yet developed.

**Sheets.**—Considerable activity developed during the week in the automotive field. The Ford Motor Co. and some of the other car and body manufacturers are in the market for sheets for shipment over the next few weeks or through the third quarter, and a portion of this business has been placed with Ohio mills. Some of the automobile manufacturers are showing hesitation in buying because the new prices have not yet been well tested, but the regular quotations of 3c., Pittsburgh, for black, 2.25c. for blue annealed and 3.85c. for galvanized appear to be well maintained. However, a mill basing point is still being rather commonly used by some of the Ohio mills, which is of considerable advantage to buyers in northern Ohio. One mill using a Pittsburgh base is going to 2.20c. for blue annealed sheets in round lots.

**Strip Steel.**—Specifications are good, but consumers are showing little interest in third quarter contracts, although some of the mills have had their books open for two weeks. While present prices on hot-rolled strip are untested, these are \$4 a ton lower than prevailed at the end of last year, although they are considerably higher than the prices at which consumers are now securing shipments.

**Reinforcing Bars.**—Inquiry is out for several buildings for Charity Hospital, Cleveland, which will require a round tonnage. Small lots are in fair demand. Rail steel bars are unchanged at 1.70c. to 1.75c., mill, but these prices are bringing little business in competition with billet steel bars.

**Warehouse Business.**—Black sheets out of stock have been advanced \$2 a ton. Other warehouse prices are unchanged and firm. The volume of business continues light, with individual orders quite small.

**Iron Ore.**—Shipments of Lake Superior ore by water during May amounted to 7,752,471 tons, an increase of 1,638,887 tons over May, last year. Lake shipments up to June 1 were 9,312,557 tons, an increase of 3,189,309 tons over the same period last year. The gain in shipments is due to the early opening of the season of navigation this year, as compared with the late opening last year.

**Coke.**—The market is very dull. While some consumers are closing contracts for the last half for the higher priced grades of Connellsville foundry coke and for by-product foundry coke, most of the foundries are showing little interest in contracts. Prices of Connellsville foundry coke are unchanged at from \$4, ovens, for some of the standard brands up to \$5.35 for premium brands.

**Bolts, Nuts and Rivets.**—The demand for these products, which has been rather light for several weeks, declined still more during the past week, and as a result some of the manufacturers have further reduced production. Regular discounts apparently are being maintained, although the new business that is coming out is not of sufficient size to test the market.

**Old Material.**—No purchases were made by the mills during the week, and shipments are still being regulated to meet requirements. There is a limited demand among dealers for steel-making and blast furnace scrap, and they are paying the quoted prices for small lots. A considerable portion of the scrap offered by the Detroit automobile manufacturers for June shipment

is reported to have been sold for Buffalo delivery, most of the remainder going to Youngstown and Canton, Ohio, mills. With the exception of a 25c. a ton reduction on machine shop turnings, prices show no change from a week ago.

**Prices per gross ton, delivered consumers' yards:**

**Basic Open-Hearth Grades**

No. 1 heavy melting steel.....	\$13.50 to \$13.75
No. 2 heavy melting steel.....	13.00 to 13.25
Compressed sheet steel.....	13.00 to 13.25
Light bundled sheet stampings...	11.50 to 12.00
Drop forge flashings.....	12.50 to 13.00
Machine shop turnings.....	8.75 to 9.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	13.75 to 14.00
No. 1 busheling.....	11.50 to 11.75
Pipes and flues.....	10.00 to 10.50
Steel axle turnings.....	12.50 to 13.00

**Acid Open-Hearth Grades**

Low phosphorus forging crops...	16.50 to 17.00
Low phosphorus, billet bloom and slab crops .....	17.00 to 17.50
Low phosphorus sheet bar crops...	16.00 to 16.50
Low phosphorus plate scrap.....	16.00 to 16.50

**Blast Furnace Grades**

Cast iron borings.....	10.25 to 10.50
Mixed borings and short turnings	10.25 to 10.50
No. 2 busheling.....	10.25 to 10.50

**Cupola Grades**

No. 1 cast.....	16.50 to 17.00
Railroad grate bars.....	12.00 to 12.50
Stove plate .....	12.00 to 12.50
Rails under 3 ft.....	18.00 to 18.50

**Miscellaneous**

Railroad malleable .....	15.50 to 16.00
Rails for rolling.....	16.25 to 16.50

## Philadelphia

### Steel Buying Shows Further Decrease and Some Price Weakness Develops

PHILADELPHIA, June 7.—To some extent the recent decline in the volume of steel buying is attributed to a paring down of railroad orders. The Pennsylvania road in particular is not showing the buying interest of a year ago, its orders for the first five months of 1927 having fallen considerably below those of the same period last year. The disposition to keep inventories at a low level is true of all of the Eastern roads. When railroad orders are left out of the accounting and the decline in building construction is also taken into consideration, the remaining volume of business coming from general industrial users of steel shows no marked variation from that of last year at this time, nor is the total for the first five months of the year below the 1926 average.

With the letting down in ordering which has come within the past two weeks fresh price weakness has developed in plates and shapes. Sheets are being held quite firmly at the new price schedule, but the amount of buying is too small to give the market a real test, which will come when third quarter requirements are purchased. Prices of wire products and hot and cold-rolled strip steel are being fairly well held.

Dullness prevails in the pig iron and scrap mar-

**Warehouse Prices, f.o.b. Philadelphia**

	Base per Lb.
Plates, ¼-in. and heavier.....	2.80c. to 3.00c.
Plates, ⅜-in. ....	3.00c. to 3.20c.
Structural shapes .....	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands).....	2.70c. to 3.20c.
Round-edge iron .....	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.....	3.50c.
Round-edge steel, planished.....	4.30c.
Reinforcing steel bars, square, twisted and deformed.....	3.00c.
Cold-finished steel, rounds and hexagons .....	4.00c.
Cold-finished steel, squares and flats .....	4.50c.
Steel hoops .....	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅜-in., inclusive .....	3.60c. to 3.90c.
Spring steel .....	5.00c.
Black sheets (No. 24).....	4.35c.
Galvanized sheets (No. 24).....	5.20c.
Blue annealed sheets (No. 10)...	3.30c.
Diamond pattern floor plates—	
¼-in. ....	5.30c.
⅜-in. ....	5.50c.
Rails .....	3.20c.
Swedish iron bars.....	6.60c.



kets, with scrap prices continuing to weaken, but pig iron demand is not sufficient to bring out any real competition for orders.

**Pig Iron.**—While the situation in the pig iron market is in no sense making for strength, the prices quoted on foundry iron continue at recent levels, namely \$21, furnace, for No. 2 plain and \$21.50 for No. 2X. Shipments to foundries in this district are considerably below those of the same period a year ago, and fresh buying is in very small volume. Nearly all of the large consumers have enough iron contracted for to carry through this month and well into third quarter. The buying for third quarter, which ordinarily might be expected to develop at this time, has not started, nor are there any signs of it. The trade has ceased to expect that any great amount of iron will be purchased for the next quarter in view of the decline in foundry operations. The largest inquiry from nearby consumers is from a radiator company at Trenton, N. J., which is in the market for a few thousand tons. A steel company at Johnstown, Pa., is inquiring for 1200 tons of low phosphorus iron.

*Prices per gross ton at Philadelphia:*

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.76 to \$22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X.	22.76 to 23.26
Basic (delivered eastern Pa.)	20.75 to 21.25
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$5.17 from Virginia furnaces.

**Ferromanganese.**—The two recent declines in the quotations on ferromanganese have brought about no activity that can be attributed to the easing of the market. Judging from the small amount of new business recently placed, consumers are well provided for and the present quotations of \$90, seaboard, available from all sources of supply, have not tempted buyers to any extent.

**Billets.**—Quotations continue at \$34 to \$35, Pittsburgh, for rerolling billets and at \$40 for forging billets. Orders are few and usually for single heats. A number of users of forging billets are cutting their costs by taking an intermediate grade, which is actually a rerolling quality with a moderate amount of chipping, this grade being sold at about \$2 above the rerolling billet price.

**Plates.**—There is a more eager search for orders and a consequent letting down in adherence to quotations which have recently been in effect. On small orders which recently brought 1.90c., Pittsburgh, some mills now quote 1.85c., while on the larger tonnages it is easier to obtain quotations of 1.80c., Pittsburgh.

**Structural Shapes.**—Prices quoted on structural shapes continue to show a wider variation than on any other steel product. The difficulty in naming any figure as a "market" price lies in the fact that both large and small producers are competing actively for business, and what is a small or moderate-size order to the large mill may be considered by the smaller mill as very desirable. There is a dearth of tonnages running in excess of a carload lot, and on that amount quotations range from 1.75c. to 1.80c., Pittsburgh. Smaller lots frequently are sold at 1.85c. On some of the larger structural projects the price is subject to special negotiation, but such lots, when they run into the hundreds of tons, have been sold at 1.70c. or less, Pittsburgh base. The largest new project is the City Hall Annex, which will take 2000 tons.

**Bars.**—The demand for steel bars has fallen off. Lettings of concrete reinforcing projects continue at a fairly good rate, but in merchant bars the amount of ordering is perceptibly less, leaving gaps in rolling schedules. Quotations continue at 1.85c., Pittsburgh. Bar iron is quoted usually at 2.12c., Philadelphia.

**Sheets.**—Some sales of blue annealed sheets are being made at 2.25c., Pittsburgh, but the amount of

buying of all grades is not large. Quotations are being firmly held at the new schedule, but sellers look to the filling of third quarter requirements, which must develop soon, as the real test of the market.

**Imports.**—Last week's imports at Philadelphia were 141 tons of structural shapes from Belgium and 25 tons of scrap iron from Sweden.

**Old Material.**—Further weakness in several grades of scrap is due to the excess of supply over demand. Grades which are off about 50c. a ton are No. 1 railroad wrought, old iron carwheels, No. 1 cast and pipes and tubes. The maximum obtainable for bundled sheets and machine shop turnings for steel works use is \$10. Offers of \$9.50 are being made by one consumer, but the amount of business done at that price is inconsequential.

*Prices per gross ton, delivered consumers' yards, Philadelphia district:*

No. 1 heavy melting steel	\$14.00 to \$14.50
Scrap T rails	13.50 to 14.00
No. 2 heavy melting steel	12.00 to 13.00
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	10.00
Machine shop turnings (for steel works)	10.00
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.50
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	11.50 to 12.00
Stove plate (for steel works)	11.50 to 12.00
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
No. 1 blast furnace scrap	10.50
Machine shop turnings (for rolling mill)	10.50 to 11.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50 to 13.00
Shafting	18.00 to 18.50
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 17.00
Cast borings (for chemical plant)	15.00 to 16.00

## FOUNDRYMEN IN SESSION

### Chicago Meeting Discussed Qualities of Pig Iron Going Into Castings

CHICAGO, June 7.—Attendance at the thirty-first annual convention of the American Foundrymen's Association on the first day of technical sessions is over 1200. This is the first convention in 20 years of which an exposition was not a part. The program is confined entirely to sessions on technical foundry subjects, foundrymen and metallurgists from all parts of the country and many from Canada being present.

On the first day the feature has been the conference on the qualities of pig iron for casting purposes, the attendance at which was close to 300. Ralph H. Sweetster, American Rolling Mill Co., Columbus, Ohio, was chairman. Representatives of blast furnace plants and various foundries discussed many phases of the problem. Three representatives of the Department of Commerce were present, at the suggestion of the board of directors. They were: Dr. C. H. Herty, Jr., of the Bureau of Mines, Pittsburgh; T. L. Joseph, Bureau of Mines, Minneapolis, and C. M. Saeger, Jr., Bureau of Standards, Washington. They took part in the discussion and offered their cooperation.

At the close of the meeting a resolution was passed to conduct a cooperative study of the effects of varying blast furnace operations on the character of the pig iron and on the castings made therefrom, under the supervision of the United States Department of Commerce, with an advisory committee consisting of representatives of national technical associations, such as the American Foundrymen's Association, American Pig Iron Association, American Institute of Mining and Metallurgical Engineers and American Society for Testing Materials.

This morning the session on general foundry practice was attended by over 250, and there were meetings on apprentice training and on foundry costs.



# San Francisco

## Holiday Retards Steel Buying—Low Quotations on Foreign Steel

SAN FRANCISCO, June 4 (*By Air Mail*).—Features of a week of light buying in nearly all departments of the market were the arrival at this port of 448 tons of Belgian steel, a letting of 1000 tons of fabricated structural steel for a theater in Oakland, Cal., and a notable falling off of orders for reinforcing bars and cast iron pipe. While the situation in regard to prices is unchanged, there have been several recent instances of low quotations on foreign steel, notably on soft steel bars. It is understood that some local jobbers have offered Belgian merchant bars recently, in small lots from stock, at 2.15c. per lb., f.o.b. San Francisco. Higher quotations, however, are more common. Of the shipment that arrived here this week, 200 tons was reinforcing steel, 115 tons small angles and the remainder, 133 tons, merchant steel.

**Pig Iron.**—The 1000 tons of foundry iron awarded a week ago by the Southern Pacific Co., San Francisco, was placed with a Western furnace. During the past week little business has developed. Quotations are unchanged.

*Prices per gross ton at San Francisco:*

•Utah basic .....	\$25.00 to \$26.00
•Utah foundry, sil. 2.75 to 3.25 .....	25.00 to 26.00
•Indian foundry, sil. 2.75 to 3.25 .....	25.00
•German foundry, sil. 2.75 to 3.25 .....	24.25

•Delivered San Francisco.  
••Duty paid, f.o.b. cars San Francisco.

**Shapes.**—The Judson Mfg. Co., San Francisco, took the largest individual letting of the week, 1000 tons for a theater in Oakland, Cal. Total lettings in fabricated structural steel amount to 1353 tons. Fresh inquiry is light. Nine buildings for St. Louis College, Honolulu, T. H., will require 200 tons, on which bids will be opened June 13. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

**Plates.**—Bids have been opened but no award has been announced on 500 tons for the proposed Milton pipe line for the Nevada Irrigation District, Grass Valley, Cal. No award has been made as yet in connection with 728 tons for a pipe line for the city of Spokane, Wash., on which bids were opened June 2. At Hoquiam, Wash., the Union Oil Co. is taking bids on 75 to 688 tons of plates for tank work, and in Monterey, Cal., the Pacific Gas & Electric Co. is taking bids on 360 tons for a gas holder of 500,000 cu. ft. capacity. Eastern mills quote plates at 2.30c., c.i.f. Coast ports.

**Bars.**—In the reinforcing bar market there has been a falling off both in lettings and inquiries during the week, locally and in Los Angeles. The largest individual letting, 200 tons for a bridge on North Spring Street, Los Angeles, was placed with an unnamed company through the Western Construction Co., the general contractor. Local reinforcing bar jobbers quote as follows: 2.85c., base, per lb. on lots of 200 tons and 3.10c., base, on less-than-carload lots.

**Cast Iron Pipe.**—Lettings of the week include the following: San Diego, Cal., 316 tons of 6 and 10-in. Class B pipe to an unnamed maker through Ben Pearce, general contractor. Santa Monica, Ca., 264 tons of 4, 6 and 8-in., Classes 150 and 250, centrifugal pipe to the Pacific States Cast Iron Pipe Co., Provo, Utah. Tacoma, Wash., has opened bids on 757 tons of 6, 16 and 18-in. Class B pipe, and Glendale, Cal., will open bids June 9 on about 100 tons of 12-in. Class C pipe.

### Warehouse Prices, f.o.b. San Francisco

Plates and structural shapes .....	3.00c.
Soft steel bars .....	3.00c.
Small angles, $\frac{1}{8}$ -in. and over .....	3.00c.
Small angles, under $\frac{1}{8}$ -in. ....	3.40c.
Small channels and tees, $\frac{3}{4}$ -in. to 2 $\frac{3}{4}$ -in. ....	3.60c.
Spring steel, $\frac{1}{4}$ -in. and thicker .....	5.00c.
Black sheets (No. 24) .....	4.80c.
Blue annealed sheets (No. 10) .....	3.75c.
Galvanized sheets (No. 24) .....	5.35c.
Common wire nails, base per keg .....	\$3.75
Cement coated nails, 100-lb. keg .....	3.75

**Warehouse Business.**—Sales during the week have been light, partly on account of the holiday. Jobbers say that few buyers are anticipating forward requirements. Quotations are unchanged.

**Coke.**—The Southern Pacific Co., San Francisco, has not placed its recent inquiry for 500 tons. This department of the market is moderately active. Quotations are unchanged. Both English and German by-product coke are offered at \$11.50 to \$12.50 per net ton at incoming dock. English beehive fuel is quoted at about \$17. Fresh shipments from Europe are expected within a week or ten days.

# Birmingham

## Steel Output Continues to Sag—Pig Iron Buying Limited to Early Needs

BIRMINGHAM, June 7.—Furnace interests look forward to third quarter buying of pig iron to set in, although there are as yet no indications of any deviation from the present policy of short-term purchasing. The aggregate of small-lot sales of foundry iron, however, is virtually equal to production. The two blast furnaces put out recently were not merchant stacks. The market remains at \$18 per gross ton, Birmingham, for No. 2 foundry iron, with indications that it will continue at that level. While the larger consumers of iron expect to complete orders on hand and in sight within a few weeks, furnaces continue to make steady deliveries. Stocks of pig iron on furnace banks are not increasing. Nine blast furnaces in this district are on foundry iron, 10 are on basic and one is on special iron.

*Prices per gross ton, f.o.b. Birmingham district furnaces:*

No. 2 foundry, 1.75 to 2.25 sil. ....	\$18.00
No. 1 foundry, 2.25 to 2.75 sil. ....	18.50
Basic .....	18.00
Charcoal, warm blast .....	29.00

**Rolled Steel.**—Steel production in this section is still on a curtailed basis, with several open-hearth furnaces idle. Finishing mills are also reducing operations. The recession in output, however, is expected to be short-lived. Mill prices are unchanged. The Gulf States Steel Co., Birmingham, plans to make a number of improvements at Alabama City, including an increase in its blast furnace capacity, an expansion of its by-product coke plant and a rounding out of its steel works.

**Cast Iron Pipe.**—Lettings are not so numerous as some time ago, and quotations on pressure pipe are weak. Concessions below \$36 and \$37, Birmingham, for 6-in. and larger sizes are again reported.

**Coke.**—Independent coke producers continue to keep output in step with demand but have not found it necessary to reduce operations any further in the last few weeks. No foundry coke is accumulating at the ovens, and prices are steady at \$5.50 per net ton, Birmingham. Iron and steel companies are maintaining their coke production fairly well. Work is being pushed on additions to by-product plants, which will involve an expenditure of several million dollars.

**Old Material.**—Prices are weak but unchanged, and demand is slow. Consumers of heavy melting steel are not pressing for material.

*Prices per gross ton, delivered Birmingham district consumers' yards:*

Heavy melting steel .....	\$12.00 to \$12.25
Scrap steel rails .....	12.50 to 13.00
Short shoveling turnings .....	8.50 to 9.00
Cast iron borings .....	8.50 to 9.00
Stove plate .....	13.00 to 14.00
Steel axles .....	16.00 to 17.00
Iron axles .....	16.00 to 17.00
No. 1 railroad wrought .....	11.00 to 12.00
Rails for rolling .....	13.00 to 14.00
No. 1 cast .....	15.00 to 16.00
Tramcar wheels .....	12.50 to 13.50
Cast iron carwheels .....	12.00 to 13.00
Cast iron borings, chemical .....	13.00 to 13.50

Rogers Brown & Crocker Brothers, Inc., has moved its Boston office from the Chamber of Commerce Building to the Consolidated Building, 250 Stuart Street.

# Cincinnati

## Lake Pig Iron Lower—Concession on Southern Basic Reported

CINCINNATI, June 7.—A report that a steel company in this district has recently contracted for a large tonnage of basic iron with a producer in the Birmingham section is of outstanding interest in the pig iron market. It is understood that the price paid was \$16.50, Birmingham, a cut of \$1.50 a ton under the schedule prevailing in the South. Aside from this major transaction, sales have been at a low point. In only a few instances have orders amounted to more than 200 tons, and inquiries hold out little promise of improvement in the immediate future. Southern Ohio foundry iron is quoted at \$19 to \$19.50, base Ironton, but bookings have been negligible. In fact, at least one furnace at Ironton is badly in need of fresh business and has been compelled to pile considerable iron. Ability to make river shipments has been the salvation of Ironton sellers, because to points taking all-rail rates they have been unable to compete successfully with northern Ohio furnaces. It is understood that the latter are selling foundry iron at as low as \$17.50 to \$17.75, base Cleveland, although in many instances \$18 is being quoted. Alabama and Tennessee iron are steady at \$18, base Birmingham, but sales in this district have lagged.

### Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	\$20.89 to \$21.39
So. Ohio malleable.....	20.64 to 21.89
Alabama fdy., sil. 1.75 to 2.25....	21.69
Alabama fdy., sil. 2.25 to 2.75....	22.19
Tennessee fdy., sil. 1.75 to 2.25....	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

**Finished Material.**—Specifications have increased, although the price situation is less favorable. There has been particular improvement in the number of orders for small tonnages calling for delivery during the next 30 days. Consumers, however, are watching inventories closely and are not purchasing material unless current needs must be met. While jobbers have been doing a fairly good business, they are buying sparingly at the moment. Mill prices on bars and structural steel are weaker, and the influence of low quotations in the East and also in the outlying territory reached by Chicago district mills is held partly accountable for this unfavorable development. Some orders for bars have been taken on a basis of 1.85c., base Pittsburgh, but several local offices of producers insist that they have made no sales at less than 1.90c. In certain instances plates have been sold at 1.85c., base Pittsburgh, and attractive orders for structural shapes have been booked at that figure. Single carloads, however, are still moving at 1.90c. A moderate volume of sheets has been moving at 3c., base Pittsburgh, for black, 2.25c. for blue annealed, and 3.85c. for galvanized stock. Almost without exception mills are able to make prompt deliveries. Producers in this territory report that incoming business is not quite so heavy as a few weeks ago, and accordingly a slight reduction in operations has been necessitated. There has been no change in the wire market. Common wire nails are quoted at \$2.50 per keg, Ironton or Pitts-

### Warehouse Prices, f.o.b. Cincinnati

	Base, per Lb.
Plates and structural shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars.....	3.30c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares.....	4.35c.
Open-hearth spring steel.....	4.75c. to 5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 24)....	3.60c.
Structural rivets.....	3.85c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.60
Common wire nails, base per keg.....	2.95
Cement coated nails, base per 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

burgh. Sales of cold-rolled strip steel have declined about 15 per cent in the past-two weeks.

**Reinforcing Bars.**—New billet bars are holding fairly well at 1.85c. to 1.90c., base Pittsburgh, and rail steel bars at 1.75c. to 1.80c., base mill.

**Warehouse Business.**—Sales in the past week have been in good volume, being about equal to the total for the corresponding period last year. From the standpoint of tonnage, bars are the outstanding product. Demand for structural steel and tank plates has fallen off somewhat. Prices are unchanged.

**Coke.**—Foundries supplying the automotive industry are specifying rather liberally against contracts, but other users are taking less than normal requirements. Consequently, shipments of by-product foundry coke are little better than they were a week ago. The movement of foundry grades from the New River and Wise County districts has been only moderate at best. Prices are unchanged, but are verging on weakness.

*Foundry coke prices per net ton, delivered Cincinnati:* By-product coke, \$9.52 to \$9.64; Wise County coke, \$7.59 to \$8.09; New River coke, \$10.09 to \$10.59. Freight rates: \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

**Old Material.**—The market continues dull. Consumers are showing practically no interest and in some cases are restricting shipments on current contracts. Prices in general are soft. Among the railroad offerings this week are the following: Chesapeake & Ohio, 12,500 tons; Norfolk & Western, 6000 tons; Baltimore & Ohio, 17,000 tons; Virginian, 2150 tons, and Illinois Central, 900 tons.

### Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$11.75 to \$12.25
Scrap rails for melting.....	13.00 to 13.50
Loose sheet clippings.....	8.50 to 9.00
Champion bundled sheets.....	9.50 to 10.00
Cast iron borings.....	8.75 to 9.25
Machine shop turnings.....	7.75 to 8.25
No. 1 busheling.....	9.50 to 10.00
No. 2 busheling.....	7.00 to 7.50
Rails for rolling.....	14.00 to 14.50
No. 1 locomotive tires.....	15.00 to 15.50
No. 1 railroad wrought.....	11.50 to 12.00
Short rails.....	17.50 to 18.00
Cast iron carwheels.....	13.25 to 13.75
No. 1 machinery cast.....	17.50 to 18.50
No. 1 railroad cast.....	14.50 to 15.00
Burnt cast.....	8.50 to 9.00
Stove plate.....	10.00 to 10.50
Brake shoes.....	10.25 to 11.00
Railroad malleable.....	13.00 to 13.50
Agricultural malleable.....	12.50 to 13.00

# Buffalo

## Better Inquiry for Pig Iron—Steady Demand for Sheets and Bars

BUFFALO, June 7.—Inquiry for pig iron is more active. A Connecticut inquiry calls for 2500 to 5000 tons of malleable, and a Buffalo district inquiry for the same grade covers 1000 to 1500 tons. The 3000 tons of foundry iron for which the Kensington-Davis Corporation, Buffalo, issued an inquiry about two weeks ago is believed to have been placed at not over \$17.50, base furnace. The base price on ordinary lots is \$18, Buffalo furnace. One furnace announces that it has booked sufficient tonnage for third quarter and will take fourth quarter business at unchanged prices.

### Prices per gross ton, f.o.b. Buffalo furnace:

No. 2 plain fdy., sil. 1.75 to 2.25....	\$17.50 to \$18.00
No. 2X foundry, sil. 2.25 to 2.75....	18.00 to 18.50
No. 1X foundry, sil. 2.75 to 3.25....	19.00 to 19.50
Malleable, sil. up to 2.25.....	17.50 to 18.00
Basic.....	17.50 to 17.75
Lake Superior charcoal.....	27.28

### Finished Iron and Steel.—Business in bars and

### Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars.....	2.75c.
Cold-finished flats, squares and hexagons.	4.45c.
Rounds.....	3.95c.
Cold rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.30c.
Galvanized sheets (No. 24).....	5.15c.
Blue annealed sheets (No. 10).....	3.80c.
Common wire nails, base per keg.....	\$3.65
Black wire, base per 100 lb.....	3.90



shapes continues to develop in good volume. Demand for sheets is very good, with local mills operating at about 85 per cent of capacity. The sheet market remains firm at 3c., base Pittsburgh, for black and 4.25c. for automobile body. The fabricators and reinforcing bar interests are awaiting awards of steel for the Victor building, bids for which have just gone in. It will require about 400 tons of structural steel and 300 tons of reinforcing bars. A new marine warehouse on the water front in Buffalo will require 1000 tons of reinforcing, and the new Cleveland & Buffalo Transportation Co. terminal in Buffalo calls for 200 to 300 tons. Five and one-half miles of road near Rochester, N. Y., have been awarded, with 125 tons of mesh going to a Buffalo maker.

**Old Material.**—Some purchasing has taken place, but no large tonnages have been bought. Mills are buying scrap as they require it. One is paying \$15 to \$15.25 for heavy melting steel, and another is buying at \$15.50. Some sales of stove plate are reported at \$14.25 to \$14.50. No. 1 cast scrap has been sold at \$16, and a few small-tonnage sales of low phosphorus are reported at around \$17.50. Lists of the Michigan Central, Erie, New York Central and Pennsylvania close this week. The Pennsylvania has a large offering. Consumers' and dealers' stocks alike are low.

Prices per gross ton, f.o.b. Buffalo consumers' plants:  
Basic Open-Hearth Grades

No. 1 heavy melting steel.....	\$15.00 to \$15.50
No. 2 heavy melting steel.....	14.00 to 14.25
Scrap rails .....	16.00 to 16.50
Hydraulic compressed sheets....	12.00 to 13.00
Hand-bundled sheets .....	11.00 to 11.50
Drop forge flashings.....	13.00 to 13.50
No. 1 busheling.....	14.50 to 15.00
Heavy steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	9.00 to 9.50

Acid Open-Hearth Grades

Railroad knuckles and couplers..	17.50 to 18.00
Railroad coil and leaf springs...	17.50 to 18.00
Rolled steel wheels.....	17.50 to 18.00
Low phosphorus billet and bloom ends .....	17.50 to 18.00

Electric Furnace Grades

Heavy steel axle turnings.....	14.00 to 14.50
Short shoveling steel turnings...	11.50 to 12.00

Blast Furnace Grades

Short shoveling steel turnings...	11.50 to 12.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings.....	11.00 to 11.50
No. 2 busheling.....	13.50 to 14.00

Rolling Mill Grades

Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	13.00 to 13.50

Cupola Grades

No. 1 machinery cast.....	16.50 to 17.00
Stove plate .....	14.00 to 14.50
Locomotive grate bars.....	13.00 to 13.50
Steel rails, 3 ft. and under.....	18.00 to 18.50
Cast iron carwheels.....	15.00 to 16.00

Malleable Grades

Railroad .....	16.50 to 17.00
Agricultural .....	16.50 to 17.00
Industrial .....	16.50 to 17.00

## Toronto

### Buying of Pig Iron and Scrap Limited to Small Lots

TORONTO, ONT., June 7.—Interest in pig iron for third quarter delivery is improving, although so far it has been chiefly confined to inquiry. Orders have been closed recently for lots of from 500 to 600 tons for immediate delivery, but the greater part of current orders range from 50 to 200 tons. Foundries and various other consumers are understood to be carrying limited tonnages in stock, and selling interests expect a continued demand on spot account from these users. Imports from European countries are increasing, while those from the United States are holding well up to former levels.

Prices per gross ton:

Delivered Toronto

No. 1 foundry, sil. 2.25 to 2.75.....	\$24.10
No. 2 foundry, sil. 1.75 to 2.25.....	24.10
Malleable .....	24.10

Delivered Montreal

No. 1 foundry, sil. 2.25 to 2.75.....	26.50
No. 2 foundry, sil. 1.75 to 2.25.....	26.50
Malleable .....	26.50
Basic .....	25.50

Imported Iron at Montreal Warehouse

Summerlee .....	36.00
Carron .....	36.00

**Old Material.**—Sales declined somewhat during the week, and while there is some interest on future account, the general volume of new business is below that of a month ago. The present demand is almost entirely for small tonnages for immediate needs of consumers, in addition to orders against old contracts. The recent slump in business is believed to be a temporary setback, and the trade is of the opinion that, with the present high average of operations among mills, foundries and various other consuming plants, the old material market is almost certain to show more life in the early future. In the Montreal district there has been a decline in sales to local consumers, but some improvement is noted in export business.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel.....	\$10.50	\$9.00
Rails, scrap .....	11.00	10.00
No. 1 wrought.....	11.00	14.00
Machine shop turnings.....	8.00	7.50
Boiler plate .....	8.00	8.00
Heavy axle turnings.....	8.50	8.50
Cast borings .....	8.50	7.50
Steel turnings .....	8.00	8.00
Wrought pipe .....	6.00	6.00
Steel axles .....	15.00	17.00
Axles, wrought iron.....	17.00	19.00
Per Net Ton		
No. 1 machinery cast.....	16.00	18.00
Stove plate .....	10.00	13.00
Standard carwheels .....	14.00	16.00
Malleable scrap .....	14.00	14.00

## St. Louis

### Pig Iron Sold for Barge Shipment Up Ohio River—Scrap Declines

ST. LOUIS, June 7.—The most important development in the local pig iron market for some time was the sale of 1000 tons of basic grades to the Andrews Steel Co., Newport, Ky., by the St. Louis Coke & Iron Corporation for shipment by barge. It is said that this will be the first movement of pig iron by the Granite City maker up the Ohio River. The same barges that move West Virginia coal by river to Granite City will be employed for the pig iron shipment, thus affording the carriers revenue for the return trip. The pig iron will be loaded from the East St. Louis docks. The sales of the Granite City maker for the week totaled about 6000 tons, of which 4000 tons was basic, including the 1000 tons mentioned above, 1000 tons bought by an Iowa melter and 2000 tons purchased by a St. Louis melter. An Illinois malleable interest took 700 tons for June, July and August delivery, while several Illinois foundries placed 300-ton lots. No outstanding inquiries are pending. Prices are unchanged. Plants specializing in gray iron castings report a marked slowing down in orders. April business of reporting jobbing foundries in the district was 14.4 per cent below that of the corresponding month in 1926, but 3.4 per cent above that of March of this year, according to the Federal Reserve Bank of St. Louis. Several important stove foundries have reduced their operations to two days a week, and April sales of the seven reporting stove manufacturers in the district were 22.6 per cent smaller than for the

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-finished rounds, shafting and screw stock .....	3.75c.
Black sheets (No. 24).....	4.80c.
Galvanized sheets (No. 24).....	5.35c.
Blue annealed sheets (No. 10).....	3.60c.
Black corrugated sheets.....	4.65c.
Galvanized corrugated sheets.....	5.30c.
Structural rivets .....	3.60c.
Boiler rivets .....	3.80c.
Per Cent Off List	
Tank rivets, $\frac{7}{8}$ -in. and smaller.....	70
Machine bolts .....	60
Carriage bolts .....	60
Lag screws .....	60
Hot-pressed nuts, square, blank or tapped.....	60
Hot-pressed nuts, hexagons, blank or tapped.....	60

same month last year and 20.3 per cent below the March, 1927, total.

**Prices per gross ton at St. Louis:**

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$20.50 to \$21.00
Northern No. 2 fdy., delivered	
St. Louis	22.16
Southern No. 2 fdy., delivered	22.42
Northern malleable, delivered	22.16
Northern basic, delivered	22.16

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Old Material.**—An East Side mill has placed orders with four dealers calling for a total of 6000 tons of melting steel. The price was extremely low, as is indicated by a reduction of 50c. a ton in dealers' offers for this item. The object of the purchase at a low price was to average down the cost of this material, and it had the effect of further depressing an already weakened market and causing further reductions in the list. Heavy shoveling steel, No. 2 railroad wrought, cast iron carwheels, No. 1 machinery cast and steel car axles have declined 50c. a ton. Agricultural malleable is off \$1.50, while wrought iron bars and transoms and railroad malleable have declined \$1 and rails for rolling, cast iron borings and No. 1 busheling have dropped 25c. Railroad lists include: Baltimore & Ohio, 17,000 tons; Texas & Pacific, 1400 tons; Chicago & Eastern Illinois, 800 tons; Mobile & Ohio, 700 tons; Kansas City Southern, 500 tons; Pullman Co., St. Louis, 200 tons; and Standard Oil Co. (Wood River, Ill.), seven carloads.

**Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:**

Heavy melting steel	\$11.00 to \$11.50
No. 1 locomotive tires	14.25 to 14.75
Heavy shoveling steel	11.00 to 11.50
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.50 to 13.00
Railroad springs	13.50 to 14.00
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.75 to 10.25
Cast iron borings	8.75 to 9.25
Iron rails	14.00 to 14.50
Rails for rolling	13.75 to 14.25
Machine shop turnings	6.75 to 7.25
Steel car axles	18.50 to 19.00
Iron car axles	23.00 to 23.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
Steel rails, less than 3 ft.	15.50 to 16.00
Steel angle bars	11.75 to 12.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	15.00 to 15.50
Agricultural malleable	11.50 to 12.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

**Finished Iron and Steel.**—The low bidders for the general contract for the St. Louis Municipal Service Building, requiring about 600 tons of structural steel and 700 tons of reinforcing bars, are the McCormack-Combs Construction Co., St. Louis. Orders for the material will not be placed until the general contract is signed. Despite reports of curtailed oil production, inquiries are pending for from 4000 to 5000 tons of plates for oil storage tanks in fields served by mills in this territory. The local mill reports that the demand for galvanized sheets shows further improve-

**Warehouse Prices, f.o.b. Boston**

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Plats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

ment. This gain is probably attributable to replacement needs in the flooded sections. Can manufacturers are buying tin plate more freely. The business of jobbers is said to have fallen off from 10 to 15 per cent in May as compared with the same month last year.

**Coke.**—Shipments of foundry coke are not running quite so heavy as in the last few weeks, and production is being curtailed. Deliveries of domestic grades showed some improvement as the result of cooler weather. Demand for industrial coke from smelters, bakeries, etc., is fair.

## Boston

### Nearby Stacks Take Most of Current Pig Iron Business—Scrap Inactive

BOSTON, June 7.—Pig iron sales in the past week were small, most sellers reporting a drop of 50 per cent or more in business. The Mystic Iron Works again took more tonnage than all other furnaces combined. Competition between that producer and New York State furnaces continues keen. No. 2X iron was bought from a New York State furnace by a Massachusetts foundry at \$21.14 a ton, delivered, which is the equivalent of less than \$16.25 a ton at Buffalo furnace. Just as the practice of comparing prices with an Alabama equivalent was discontinued some time ago, the comparison with Buffalo base prices is now being discontinued, owing to the increasing importance of New York State furnaces and the Mystic Iron Works as market factors. Time was when New England annually consumed around 600,000 tons of iron. Today consumption is at the rate of around 350,000 tons a year. The Troy, Port Henry and Mystic stacks can easily supply New England's iron requirements today. Pig iron from Buffalo, eastern and western Pennsylvania, Virginia and Alabama will continue to be used in New England, but probably to an increasing extent for mixture purposes only. A new market base for New England will probably develop, and it is likely to be Everett, Mass.

**Prices of foundry iron per gross ton, delivered to most New England points:**

Buffalo, sil. 1.75 to 2.25	\$22.41 to \$22.91
Buffalo, sil. 2.25 to 2.75	22.91 to 23.41
East. Penn., sil. 1.75 to 2.25	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Virginia, sil. 1.75 to 2.25	27.42
Virginia, sil. 2.25 to 2.75	27.92
Alabama, sil. 1.75 to 2.25	24.91 to 26.77
Alabama, sil. 2.25 to 2.75	25.41 to 27.27

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.92 from Virginia, \$6.91 to \$8.77 from Alabama.

**Coke.**—The spurt in buying of by-product foundry coke noted a week ago has not continued. The current movement of fuel from ovens is largely confined to single carloads, and reserve stocks of the New England producers are growing. Those ovens are quoting \$12 a ton, delivered within a \$3.10 freight rate zone. Good Connellsville foundry coke is obtainable at considerably less, but little is coming into New England.

**Imports.**—Imports of iron ore in May totaled 13,650 tons, all coming from African ports, contrasted with 13,125 tons in April, 13,527 tons in March, 6600 tons in February, and 16,052 tons in January. May imports of Belgian cast iron pipe totaled 3905 pieces, contrasted with 2856 pieces in April and 5209 pieces in March. During May, 109 tons of pig iron from India was received at this port, as well as consignments from Rotterdam, Gothenburg and Antwerp. Figures covering shipments from the last three ports will not be available until later in the month.

**Shapes and Plates.**—The market for plates appears firmly pegged at 1.85c. per lb., base Pittsburgh, and that for standard shapes is holding well at 1.80c. Fabricators are booking a large number of small jobs. Based on reports received, no shops are running full, 70 to 80 per cent of capacity being the average rate of operation. Most of them have enough business on their books to keep shops working on their present schedules approximately two months. Local fabricators bid on 1000 tons of steel for a Rochester, N. Y.,



theater, which is reported to have been taken by the McClintic-Marshall Co., Pittsburgh.

**Warehouse Business.**—The movement of iron and steel out of warehouse has picked up noticeably this month but is by no means brisk. Competition for business is still keen, and few warehouses adhere to published price schedules. Reinforcing bars are selling more freely than last month, but in small amounts, with total business smaller than in June, last year. The published price is 2.90c. per lb., but most business is moving at 2.80c. and 2.75c., depending on the size of the order.

**Cast Iron Pipe.**—A. Mogavero & Co., Peabody, Mass., contractor, was the low bidder for a new section of the Metropolitan Water District system, and the Warren Foundry & Pipe Co. will furnish the 2000 tons of 24 and 20-in. pipe required. That foundry was the low bidder for 718 tons of 6 to 14-in. pipe required by Revere, Mass., but all bids were rejected and new ones will be received June 10. No other municipality has bought, or contemplates buying, any round tonnage of pipe. It is reported that one of the largest New England gas companies is about to ask bids on its second half pipe requirements, which amount to approximately 6000 tons. Foundries continue to take good pipe orders privately. Prices quoted openly on domestic pipe are: 4-in., \$58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., \$53.10 to \$54.10; larger pipe, \$52.10 to \$53.10. A \$5 differential is asked on Class A and gas pipe.

**Old Material.**—Business is almost at a standstill, mills having reduced offers to such an extent that scrap producers and brokers are uninterested. The best mills will offer on steel turnings today is \$9.50 a ton, delivered, which figures back to less than \$5, on cars shipping point. Long bundled skeleton was sold in the past week at \$10, delivered, or about \$5, on cars shipping point, a drop of about \$1 a ton. Yard steel, which a week ago brought \$7 to \$7.50, on cars shipping point, is now \$6.75 to \$7.10, and price reductions on other material are noted. Some brokers report 50c. a ton loss on everything sold to mills in the past fortnight and rejections by mills on material billed at as low as \$5 a ton, shipping point. The Mystic Iron Works has bought mixed borings and turnings at \$7.50 a ton, delivered Everett, Mass., and stove plate at around \$10.

*Buying prices per gross ton, f.o.b. Boston rate shipping points:*

No. 1 heavy melting steel.....	\$9.00 to \$9.50
Scrap rails .....	8.50 to 9.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 yard wrought.....	9.50 to 10.00
Machine shop turnings.....	4.75 to 5.25
Cast iron borings (steel works and rolling mill).....	6.00 to 6.50
Bundled skeleton, long.....	5.00 to 5.25
Forged flashings.....	5.50 to 6.00
Blast furnace borings and turnings.....	5.00 to 5.50
Forged scrap .....	6.00 to 6.50
Shafting .....	13.50 to 14.00
Street car axles.....	14.00 to 14.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	8.00 to 8.50
Rails for rerolling.....	11.00 to 11.50
Cast iron borings, chemical.....	10.50 to 11.00

*Prices per gross ton, delivered consumers' yards:*

Textile cast .....	\$14.50 to \$15.00
No. 1 machinery cast.....	14.50 to 15.00
No. 2 machinery cast.....	12.50 to 13.00
Stove plate .....	11.50 to 12.00
Railroad malleable .....	15.00 to 15.50

## Seattle

### Building Outlook Good—Foreign Competition in Bars at Portland

SEATTLE, June 2 (*By Air Mail*).—Orders for steel products in May showed a falling off as compared with April, and a larger decrease as compared with May of last year. New buying is only for actual needs, with users showing no interest whatever in future needs.

Prices, in spite of the light demand, are fairly firm, except on plates and several of the lighter forms of steel. Competition between some of the Eastern mills and the Coast producer is responsible for low prices on certain products. The erection of a large warehouse in Portland and an addition to the local ware-

house of the leading steel interest indicate that this competition may become even more severe in the future.

Building in Seattle is active, permits for the first five months of this year having totaled over \$13,000,000, or virtually the same amount as in that period last year.

**Pig Iron.**—Demand for some months has been restricted to small lots, while inquiries are few. Utah basic and No. 2 foundry are bringing about \$25 per gross ton, delivered Seattle.

**Structural Shapes.**—While current business is confined to small lots, some large contracts are in sight and, no doubt, will come out during the summer. Two local jobs calling for about 250 tons each represent the only orders placed here, while work in prospect in this city includes a new Northern Life building, about 1200 tons, a new Stratford Hotel, about 600 tons, an addition to a local department store, 300 tons, and the Seattle Auditorium, 1200 to 1500 tons. Bids on the auditorium will be asked in the next two weeks. Bids have closed on a bridge in Oregon, 1500 tons, and the award is looked for in a few days. Shapes continue to be quoted at 2.35c., c.i.f. Seattle.

**Plates.**—New demand is light, and there are reports that 2.30c., Seattle, is being shaded. Jobs in sight include a new water line at Astoria, Ore., about 1500 tons, bids on which are to be opened on June 6, another water line at Spokane, Wash., 600 tons, and the long talked of 30 miles of 36-in. pipe for the Tacoma water line. The Tacoma line may not come out for some time, as there is a fight on between sellers of electric welded steel pipe and wooden pipe for this work. On small lots of plates 2.35c. is the ruling price and on large lots, 2.30c., although the latter is not the minimum in the local market.

**Bars.**—Buying is restricted, being confined mainly to small lots. The local market on mild steel bars is about 2.35c., delivered, while on reinforcing bars there is no definite price, although from 2.10c. to 2.25c. is probably a fair average, with reports, not verified, that as low as 2c. has been done. Little foreign bar steel is coming into the local market, but a considerable tonnage is going into Portland. Belgian and German mild steel bars have sold at as low as 1.65c., and reinforcing bars at 1.75c., c.i.f. Portland, but this is mostly Bessemer steel and the bars are not straightened or finished as perfectly as domestic bars.

**Track Supplies.**—Inquiries are out for 40,000 tie plates, 300 kegs of spikes, 5 tons of track bolts and 5000 rail anchors for the Alaska Railroad. This material is for the 1000 tons of rails bought recently for that road from the Bethlehem Steel Corporation.

**Sheets.**—The local market is quiet, orders being for small lots to meet current needs. There is some variation in prices. Eastern mill prices for No. 24 gage galvanized are 4.43½c., for No. 24 black, 3.58c., and for No. 10 annealed, 2.82½c., all c.i.f. Seattle. However, these are not minimum prices, being subject to shading depending on the desirability of the order.

**Old Material.**—The feature of the local scrap market is heavy inquiry for scrap from Japan. While China is the main source of ore supply for Japan, civil war has curtailed operations at the Chinese ore mines, thus necessitating that Japan use more scrap in its steel works. Large inquiries have come to Seattle in the past several months from Japan for scrap, but no bottoms are available, and probably will not be until about Nov. 1, or later. Local dealers say they have been offered as high as \$18 per gross ton for heavy melting steel, c.i.f. Kobe or Yokohama. It is reported that the Southern Pacific Co. has sold 5000 tons of old carwheels for shipment to Japan via New Orleans. It is also stated that a shipment of 3000 tons or more of old steel rails has been made recently from New Orleans to Japan, and that negotiations for still larger tonnages of rails and carwheels are under way. There is little activity in the local market, and prices of scrap are largely nominal. Heavy melting steel in charging box sizes is held at \$10 per gross ton; miscellaneous scrap is quoted at \$8 per gross ton; cast iron scrap, at \$15 per net ton, and steel borings, at \$5 per gross ton, all f.o.b. Seattle.

## FABRICATED STRUCTURAL STEEL

### Week's Awards 23,600 Tons With New Projects Amounting to 25,000 Tons

Structural steel lettings for the week are reported at 23,600 tons, the largest being 3120 tons for barges. Pending projects total about 25,000 tons, including 8900 tons for New York subway construction, 2000 tons for a City Hall Annex in Philadelphia and 2000 tons for a building at Tulsa, Okla. Awards follow:

BOSTON, 150 tons, Jamaica Plain district, home for children, to unnamed fabricator.  
 NEW YORK, 1940 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: Trinity Lutheran Church, Hollis, L. I., to McClintic-Marshall Co.; six-story loft building, Eighth Avenue and Thirty-seventh Street; Jewish Center, Coney Island, 12-story bank building, 70 Wall Street, and 12-story loft building, 214 West Thirtieth Street, to A. E. Norton, Inc.; theater, Broadway and Canal Street, planing mill, 427 East Thirtieth Street and two-story garage, Exterior and 230th Streets, to Levering & Garrigues Co.  
 READING RAILROAD, 225 tons, bridge at Haddon Heights, N. J., to Phoenix Bridge Co.  
 NEW YORK, 1650 tons, loft building on West Twenty-ninth Street, to Hedden Steel Construction Co.  
 NEW YORK, 700 tons, loft building on West Twenty-ninth Street, to Harris Structural Steel Co.  
 NEW YORK, 1600 tons, building for Shroder & Koppel, Inc., to Levering & Garrigues Co.  
 NEW YORK CENTRAL RAILROAD, 250 tons, bridge, to an unnamed fabricator.  
 BALTIMORE & OHIO RAILROAD, 250 tons, bridges, to Mount Vernon Bridge Co.  
 ROCHESTER, N. Y., 1000 tons, theater, to McClintic-Marshall Co.  
 PHILADELPHIA, 200 tons, two barges for United Gas Improvement Contracting Co., to Dravo Contracting Co.  
 PHILADELPHIA, 250 tons, two deck barges for United States Engineers, to Dravo Contracting Co.  
 WASHINGTON, 3120 tons, 20 barges for Inland Waterways Corporation, 10 to Dravo Contracting Co., five to American Bridge Co. and five to Midland Barge Co., Midland, Pa., these being in addition to some recently contracted for, making 45 in all.  
 ASHEVILLE, S. C., 188 tons Junior beams, high school, to Jones & Laughlin Steel Corporation.  
 BEAUMONT, TEX., 125 tons, central fire station, to Orange Car & Steel Co., Orange, Tex.  
 FORT WORTH, TEX., 2000 tons, shops for Texas & Pacific Railroad, to Virginia Bridge & Iron Co.  
 ROCHESTER, PA., 170 tons, Batchelor Brothers Building, to Pittsburgh Bridge & Iron Co.  
 ROCHESTER, PA., 100 tons, Epileptic Home, to Pittsburgh Bridge & Iron Co.  
 PITTSBURGH, 660 tons, including 330 tons Junior beams, building for Board of Education, to Jones & Laughlin Steel Corporation.  
 MARTINSBURG, W. VA., 341 tons, including 53 tons Junior beams for a high school, to Jones & Laughlin Steel Corporation.  
 STEUBENVILLE-WEIRTON, 1800 tons, bridge, to Dravo Contracting Co.  
 CINCINNATI, 400 tons, reconstruction of Music Hall, to Hetherington & Berner, Indianapolis.  
 CINCINNATI, 200 tons, building for Cincinnati Chemical Works, to McClintic-Marshall Co.  
 AKRON, OHIO, 100 tons, bowling alley building, to Gilbert Steel Co.  
 LANSING, MICH., 300 tons, Saginaw Street bridge, to American Bridge Co.  
 ST. JOSEPH, MICH., 153 tons Junior beams, Whitcomb Hotel, to Jones & Laughlin Steel Corporation.  
 PEKIN, ILL., 1900 tons, power plant, to Mississippi Valley Structural Steel Co.  
 HARRISBURG, ILL., 300 tons, coal tippie, to Continental Bridge Co., Chicago.  
 CHICAGO, 100 tons, building for Chicago Macaroni Co., to Wendnagel & Co., Chicago.  
 CHICAGO, 225 tons, Presbyterian Church, to Wendnagel & Co.  
 CHICAGO, 1550 tons, bridges across Illinois Central tracks, to American Bridge Co.  
 CHICAGO, 100 tons, subway at Thirty-first Street, to American Bridge Co.  
 CHICAGO, 300 tons, switch house for Commonwealth Edison Co., to McClintic-Marshall Co. This is in addition to 1000 tons recently placed.  
 BROWNSVILLE, CAL., 100 tons, Cotterell flue for Pacific Portland Cement Co., to Steel Tank & Pipe Co., Berkeley, Cal.  
 SANTA BARBARA, CAL., 220 tons, building for Santa Barbara Telephone Co., to Llewellyn Iron Works.  
 OAKLAND, CAL., 1000 tons, West Coast Theater, Nineteenth

Street and Telegraph Avenue, to Judson Mfg. Co., San Francisco.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 330 tons, transit department, bids close June 15.  
 BOSTON, 151 tons, store and office building, Newbury and Berkeley Streets.  
 SOMERVILLE, MASS., 237 tons, Agar Mfg. Co. plant.  
 NEW HAVEN, CONN., 1100 tons, medical building, Yale University.  
 NEW YORK, 8900 tons, sections of subway, route 45: section 1, 5400 tons and section 2, 3500 tons.  
 NEW YORK, 275 tons, swimming pool, Van Cortlandt Park.  
 NEWARK, N. J., 4000 tons, New York Telephone building; general contract awarded to Turner Construction Co.  
 ATLANTIC CITY, N. J., 400 tons, apartment building.  
 PENNSYLVANIA RAILROAD, 1000 tons, substation.  
 PHILADELPHIA, 2000 tons, City Hall Annex; bids close June 13.  
 WILMINGTON, DEL., 250 tons, armory.  
 PENNSYLVANIA RAILROAD, 235 tons, bridge at Toledo, Ohio, on which McClintic-Marshall Co. is low bidder.  
 PENNSYLVANIA RAILROAD, 120 tons, bridge at Cresson, Pa., on which the American Bridge Co. is low bidder.  
 PENNSYLVANIA RAILROAD, 1000 tons, bridge at Richmond, Ind.  
 READING RAILROAD, 225 tons, bridge at Sinking Spring, Pa.  
 BUFFALO, 400 tons, Victor building; bids in.  
 SANDUSKY, OHIO, 1600 tons, Sandusky Bay automobile bridge; bids taken.  
 CLEVELAND, 1000 tons, May Co. warehouse.  
 CHICAGO, 2000 tons, Engineers' Building; Dilks Construction Co., general contractors.  
 TALPA, TEX., 500 tons, lumber mill.  
 TULSA, OKLA., 2000 tons, Exchange Bank Building.  
 HOQUAM, WASH., 75 to 788 tons, oil storage tanks for Union Oil Co.; bids June 6.  
 MONTEREY, CAL., 360 tons, 500,000-cu. ft. gas holder for the Pacific Gas & Electric Co.; bids June 6.  
 SAN FRANCISCO, 190 tons, community apartment building.  
 HONOLULU, 200 tons, nine buildings for St. Louis College; bids June 13.

## RAILROAD EQUIPMENT

### Illinois Central Buys 4500 Freight Cars and Reading Buys 1000

With 4500 freight cars ordered by the Illinois Central and 1000 bought by the Reading, the business of the past week has amounted to more than was placed during the whole month of May. The Illinois Central also ordered 15 locomotives and the New York Central ordered 39. Details follow:

The Illinois Central has placed orders for 4500 cars as follows: 500 box and 300 70-ton hopper cars with the Pullman Car & Mfg. Corporation, 700 50-ton hopper cars with the Standard Steel Car Co., 500 gondola cars each with the American Car & Foundry Co. and the Illinois Car & Mfg. Co., 500 automobile box cars each with the Pressed Steel Car Co. and the General American Car Co., 500 box cars with the Mount Vernon Car Mfg. Co. and 500 flat cars with the Bettendorf Co. This railroad has also ordered 15 8-wheel switching locomotives from the Baldwin Locomotive Works.

The New York Central has placed 39 locomotives with the American Locomotive Co.

The Reading has ordered 1000 steel gondola cars, dividing the order equally between the Bethlehem Steel Co. and the Standard Steel Car Co.

The Norfolk & Western is rebuilding 50 steel gondola cars in its Roanoke, Va., shops.  
 The American Refrigerator Transit Co. will repair 160 refrigerator cars in its own shops.

The St. Joseph Lead Co. has placed 350 mine cars with the American Car & Foundry Co.

The Great Northern is asking for prices on 250 general service cars.

The Chicago & Illinois Midland has placed 350 70-ton hopper cars with the Pullman Car & Mfg. Corporation.

Loading of revenue freight for the week ended May 21 exceeded 1,000,000 cars for the seventh time so far this year, according to the car service division of the American Railway Association. The total loading amounted to 1,016,803 cars, a decrease of 22,267 cars under the corresponding week last year but an increase of 29,497 cars over the corresponding week two years ago.



# NON-FERROUS METAL MARKETS

The Week's Prices	Cents per Pound for Early Delivery		June 7	June 6	June 4	June 3	June 2	June 1
			12.87 1/2	12.87 1/2	12.87 1/2	12.87 1/2	12.75	12.75
Lake copper, New York.....			12.50	12.50	12.50	12.50	12.50	12.37 1/2
Electrolytic copper, N. Y.*...			68.00	68.00	68.00	68.25	68.25	67.62 1/2
Straits tin, spot, New York.....			6.45	6.45	6.45	6.45	6.45	6.40
Lead, New York.....			6.10	6.10	6.10	6.10	6.10	6.05
Lead, St. Louis.....			6.60	6.60	6.60	6.60	6.55	6.47 1/2
Zinc, New York.....			6.25	6.25	6.25	6.25	6.20	6.12 1/2
Zinc, St. Louis.....								

\*Refinery quotation; delivered price 1/4c. higher.

NEW YORK, June 7.—Copper prices have advanced slightly on active buying in the past week. Large buying of tin also strengthened that market, which declined a fraction, however, when buying subsided. Lead is sentimentally stronger, largely because of an improved tone in London. A quiet but firm market prevails in zinc. Antimony is in better demand, with prices slightly easier.

**Copper.**—Following the heavy buying of copper which developed when it recently reached 12.50c. per lb., delivered in the Connecticut Valley, the lowest point since February, the price has strengthened so that the usual quotations today are 12.75c. to 12.87 1/2c. per lb., delivered. The buying movement has not entirely subsided, although the bulk of the heaviest purchasing has been done. In addition to the improvement in domestic demand, the market has been placed in a stronger position by heavy export sales in May, totaling close to 60,000 tons. The quoted price of the Copper Exporters, Inc., is now 13.10c. per lb., c.i.f. Hamburg. Lake copper is quiet, with asking prices ranging from 12.75c. to 12.87 1/2c.

**Tin.**—In the business week beginning Tuesday, May 31, and ended Friday, June 3, about 2500 tons of tin was sold in the New York market at prices ranging from 67.62 1/2c. per lb. to 68.25c. The large volume of business, together with some mystification in the trade as to the reasons prompting it, strengthened the market more than 1/2c. a lb. At the opening of business this week, when the demand halted, the price receded to 68c. Today, however, there was fresh interest and

about 200 tons changed hands, all for June delivery. The unknown reasons for the heavy buying of last week, which was done almost exclusively by dealers, gave rise to several market rumors all of which seemed to lack substantiation, but the feeling was prevalent that strong speculative interests had possession of information which caused them to switch to the bull side of the market. The amount of tin bought was not only sufficient to cover all outstanding short sales, but left a comfortable margin to be held for expected profits. Spot standard was quoted today in the London market at £295 10s., future standard at £298 15s., spot Straits at £311 10s., and the Singapore price was £295 12s. 6d.

**Lead.**—Due largely to a stronger market in London, the lead situation here has strengthened within the past week. The quotation of the American Smelting & Refining Co. remains at 6.40c. per lb., New York, but some outside interests are reported to have made sales at 6.50c., New York, or 6.15c., St. Louis.

**Zinc.**—The market is firm at 6.25c. per lb., St. Louis, or 6.60c., New York, representing a total advance of 12 1/2 points since our report of a week ago.

**Antimony.**—There is a fairly good consumer demand for antimony, but no strength in prices, which generally are 12.75c. to 13.25c. per lb., duty paid, New York, for carload lots.

**Nickel.**—The price of ingot nickel in wholesale lots continues unchanged at 35c. per lb., with shot nickel at 36c. and electrolytic at 39c.

**Aluminum.**—Virgin metal in ingots ranges from 25c. to 26c. per lb., delivered.

## Non-Ferrous Metals at Chicago

JUNE 7.—The price of lead, after having eased off early in the week, has reacted upward in a market that is stronger. Copper is steady, and tin and zinc have advanced. Antimony is more plentiful, and prices have moved down.

Prices, per lb., in carload lots: Lake copper, 13c.;

## Metals from New York Warehouse

### Delivered Prices Per Lb.

Tin, Straits pig.....	69.50c. to 70.50c.
Tin, bar.....	71.50c. to 72.50c.
Copper, Lake.....	14.00c.
Copper, electrolytic.....	13.75c.
Copper, casting.....	13.25c.
Zinc, slab.....	7.00c. to 8.00c.
Lead, American pig.....	7.50c. to 8.50c.
Lead, bar.....	9.50c. to 10.50c.
Antimony, Asiatic.....	15.00c. to 15.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure).....	29.00c. to 30.00c.
Babbitt metal, commercial grade.....	30.00c. to 40.00c.
Solder, 1/2 and 1/2.....	42.00c. to 43.00c.

## Metals from Cleveland Warehouse

### Delivered Prices Per Lb.

Tin, Straits pig.....	73.50c.
Tin, bar.....	75.50c.
Copper, Lake.....	14.00c.
Copper, electrolytic.....	14.00c.
Copper, casting.....	13.25c.
Zinc, slab.....	8.35c.
Lead, American pig.....	7.50c.
Antimony, Asiatic.....	17.50c.
Lead, bar.....	9.25c.
Babbitt metal, medium grade.....	22.00c.
Babbitt metal, high grade.....	78.50c.
Solder, 1/2 and 1/2.....	43.50c.

## Rolled Metals from New York or Cleveland Warehouse

### Delivered Prices, Base Per Lb.

<b>Sheets—</b>	
High brass.....	17.75c. to 18.50c.
Copper, hot rolled.....	21.50c. to 22.50c.
Copper, cold rolled, 14 oz. and heavier.....	23.75c. to 24.75c.
<b>Seamless Tubes—</b>	
Brass.....	22.62 1/2c. to 23.62 1/2c.
Copper.....	23.50c. to 24.50c.
Brazed Brass Tubes.....	25.75c. to 26.75c.
Brass Rods.....	15.50c. to 16.50c.

### From New York Warehouse

### Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	10.50c. to 11.00c.
Zinc sheets, open.....	11.00c. to 11.25c.

## Non-Ferrous Rolled Products

There has been no change in the mill price on bronze, brass, and copper products since May 27. Zinc sheets and lead full sheets are still being quoted at the reductions of April 25 and May 16 respectively.

## List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass.....	17.75c.
Copper, hot rolled.....	21.50c.
Zinc.....	9.75c.
Lead (full sheets).....	10.00c. to 10.25c.
<b>Seamless Tubes—</b>	
High brass.....	22.62 1/2c.
Copper.....	23.50c.
<b>Rods—</b>	
High brass.....	15.50c.
Naval brass.....	18.25c.
<b>Wire—</b>	
Copper.....	14.75c.
High brass.....	18.25c.
Copper in Rolls.....	20.37 1/2c.
Brazed Brass Tubing.....	25.75c.

## Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base.....	45.00c.
Machine rods.....	34.00c.

## Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—		Base per Lb.
High brass	.....	18.75c.
Copper, hot rolled	.....	21.50c.
Copper, cold rolled, 14 oz. and heavier	.....	23.75c.
Zinc	.....	11.00c.
Lead, wide	.....	10.00c.
Seamless Tubes—		
Brass	.....	24.12½c.
Copper	.....	25.00c.
Brazed Brass Tubes	.....	28.00c.
Brass Rods	.....	15.50c.

tin, 69.50c.; lead, 6.35c.; zinc, 6.35c.; in less-than-carload lots, antimony, 14c. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.75c.; red brass, 8.75c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 14c.; all being dealers' prices for less-than-carload lots.

## REINFORCING STEEL

### Awards Nearly 4600 Tons and Pending Projects Total 4500 Tons

A considerable number of small awards make a total of close to 4600 tons of concrete reinforcing bars contracted for during the week. Pending projects, including 1000 tons for a marine warehouse at Buffalo, total about 4500 tons. Awards follow:

SYRACUSE, 125 tons, warehouse, to Kalman Steel Co.  
 PHILADELPHIA, 500 tons, building for Philadelphia Wholesale Drug Co., to Turner Construction Co.  
 PHILADELPHIA, 140 tons, building for Crescent Box Co., to Concrete Steel Co.  
 PHILADELPHIA, 150 tons, garage at 1515 North Broad Street, to Davis Brothers.  
 SOUTH BOSTON, 200 tons, candy factory, to Joseph T. Ryerson & Son, Inc., Boston.  
 NEW YORK, 450 tons, three sections of subway, from Patrick McGovern, Inc., to Concrete Steel Co.  
 DOVER, N. J., 100 tons, factory building, to Joseph T. Ryerson & Son, Inc.  
 SWISSVALE, PA., 100 tons, office building for Union Switch & Signal Co., to Carlem Engineering Co.  
 BUFFALO, 100 tons, Hamburg sewer improvement, to a Buffalo maker.  
 SOUTH BEND, IND., 160 tons, hotel, to Concrete Engineering Co.  
 EVANSVILLE, IND., 120 tons, packing building, to Concrete Engineering Co.  
 EVANSTON, ILL., 200 tons, business building, to Kalman Steel Co.  
 ROCKFORD, ILL., 130 tons, building for the *Morning Star*, to Concrete Engineering Co.  
 CHICAGO, 900 tons, Ribbach Building, to Concrete Engineering Co.  
 CHICAGO, 218 tons of rail steel, Jeffery Building Corporation, to Inland Steel Co.  
 CHICAGO, 150 tons, hotel, to Concrete Engineering Co.  
 CHICAGO, 480 tons, apartment building at Bryn Mawr and Kenmore Avenues, to Olney J. Dean & Co.  
 RACINE, WIS., 130 tons, printing plant, to Concrete Engineering Co.  
 SAN FRANCISCO, 100 tons, apartment building, at Pine and Stockton Streets, to Frederick Steel Co., Alameda, Cal.  
 LOS ANGELES, 200 tons, bridge, North Spring Street, to an unnamed jobber through Western Construction Co., general contractor.  
 SANTA ANA, CAL., 118 tons, bridge over San Juan Creek, to an unnamed company.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 490 tons, warehouse and loft building, Model Tenement Building Co., Eleventh Avenue and Forty-eighth Street; Turner Construction Co., general contractor.  
 BUFFALO, 1000 tons, Terminals & Transportation Warehouse Co., marine warehouse; bids asked.  
 BUFFALO, 100 tons, city court building; bids in.  
 CHICAGO, 165 tons, public school at Raven Street and North Normandie Avenue.

## Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.00c.	12.25c.
Copper, heavy and wire	10.75c.	11.75c.
Copper, light and bottoms	9.25c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.00c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.50c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.00c.	5.625c.
Lead, tea	4.00c.	4.50c.
Zinc	4.00c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	14.00c.	16.00c.

CHICAGO, 165 tons, public school at Washtenaw and North Shore Avenues.

CHICAGO, 550 tons, office building at 333 North Michigan Avenue; general contractor, Hageman & Harris Co.

ST. LOUIS, 250 to 300 tons, cover for waterworks basin at Bissell's Point for St. Louis municipal waterworks.

ALLENTOWN, PA., 250 tons, Arcadia Knitting Mills; general contract awarded.

PHILADELPHIA, 240 tons, Germantown Y. M. C. A. building.

PHILADELPHIA, 200 tons, storage warehouse.

PHILADELPHIA, 600 tons, high school at Montgomery and Thompson Streets.

PHILADELPHIA, 400 tons, factory building for Wolf Brothers.

PHILADELPHIA, 300 tons, City Hall Annex.

PHILADELPHIA, 250 tons, warehouse for Gill, Virden & Co.

## Bellanca and Lindbergh Planes Had Many Similarities in Construction

The record-breaking distance flight of Clarence D. Chamberlin and Charles A. Levine from New York to near Berlin, completed June 6, in the Bellanca plane was accomplished with a Wright Whirlwind motor, built at Paterson, N. J., by the Wright Aeronautical Corporation, identical to that used by Capt. Charles A. Lindbergh in his recent New York-Paris flight. The Bellanca plane was built by the Wright company and was designed especially to show the adaptability of the Whirlwind engine to standard running and duration flights where freight or passenger carrying capacity is desired. Like the Lindbergh plane, the Bellanca ship was built around a fuselage of molybdenum steel tubing, and the two did not differ substantially in general construction.

As mentioned in THE IRON AGE last week, the Alan Wood Iron & Steel Co., Philadelphia, furnished the steel from which the cylinder sleeve forgings used in both motors were made. The forgings were manufactured by the Tioga Steel & Iron Co., a subsidiary of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. Springs in the Whirlwind motor, most particularly the valve springs, were furnished by Miller & Van Winkle, Inc., Brooklyn. The Pontiac Tube Products Co., Inc., Brooklyn, also reports that the intake manifolds on the motors were built by that company. The Vanadium Corporation of America, New York, was responsible for many of the parts in the engines, including most of the gears, all the nuts, studs and screws and many of the plugs, pins and washers. Magneto coupling parts, valve springs and balance weight pins were made of vanadium steel.

## Prices on Transformers Reduced

The General Electric Co., Schenectady, N. Y., has announced a 5 per cent reduction in prices of distribution transformers and small power transformers, effective June 1. This reduction is the sixth since 1920. On certain types of large transformers, reductions which average 5 per cent have also been made. According to J. G. Barry, vice-president, these reductions are made possible by economies resulting from improved engineering and manufacturing methods and standardization.



## PERSONAL

Charles R. Meissner, new president of the Eastern States Blast Furnace and Coke Oven Association, is superintendent of the by-product coke department, Weirton Steel Co., Weirton, W. Va., and has been active in the affairs of the association since its organization in 1921. He served as vice-president during the past year and the year before was secretary-treasurer. He was graduated from Cornell University in 1912 as a civil engineer and since that time has been identified



C. R. MEISSNER



WILLIAM A. HAVEN

with the Oliver Mining Co., Eveleth, Minn., as a mining engineer; with the Inland Steel Co., Indiana Harbor, Ind., at the blast furnaces and coke plant; with the Wheeling Steel Corporation, as assistant superintendent by-product coke plant, East Steubenville, W. Va., and with the Koppers Co., Pittsburgh, as an experimental engineer.

William A. Haven, who was elected secretary-treasurer of the association at the annual meeting held in Pittsburgh on June 3, is superintendent of northern blast furnaces, Republic Iron & Steel Co., Youngstown, and also is a charter member of the association. Following his graduation from Pennsylvania State College in 1909 he entered the employ of the Carnegie Steel Co. in the blast furnace department at its Farrell, Pa., works, subsequently becoming blast furnace foreman at that plant and serving in a like capacity at the Clairton, Pa., works of the company. Later he went to the Marting Iron & Steel Co., Ironton, Ohio, as superintendent of blast furnaces, leaving that position to assume the one he now holds. He presented a paper, "Notes on Coke Testing," at the 1926 spring meeting of the American Iron and Steel Institute.

A. L. Broomall has been appointed manager of a newly created renewal parts engineering department of the Westinghouse Electric & Mfg. Co. He formerly held the position of renewal parts engineer. C. L. Fortescue has been named consulting transmission engineer, in which capacity he will center his attention on the fundamental problems of electrical transmission lines in general and will have a consulting relationship with engineering in other departments. G. M. Barrow has been made manager of engineering, and N. A. Wahlberg, formerly attached to the East Pittsburgh office, has been placed in charge of engineering on transmission line fittings at the Derry, Pa., works.

Benjamin Soby, since 1925 assistant to manager, sales promotion department, Westinghouse Electric International Co., has been appointed manager advertising division, Pittsburgh district office, Westinghouse Electric & Mfg. Co. He has been with the company since 1918 and for seven years was in the department of publicity, having contact with the Westinghouse

Electric International Co. on advertising and sales promotion work. Mr. Soby has lectured for several years on advertising and sales promotion work in the foreign field at the School of Business Administration, University of Pittsburgh.

Donald G. Clark, formerly Eastern manager, has been appointed director of sales of the Firth-Sterling Steel Co., McKeesport, Pa. A. E. Barker has been appointed district manager in New York; Henry I. Moore, district manager in Hartford; O. T. Smith, district manager in Boston; J. A. Mattson, special mill representative in New England; W. C. Royce, district manager in Cleveland; G. A. Jacobs, district manager in Detroit; William Ely Nelson, Jr., Pacific Coast manager, and Edwin T. Jackman, acting district manager in Chicago. All of these new managers have been associated with the Firth-Sterling Steel Co., or with E. S. Jackman & Co., its Western agents, for a number of years.

Carl H. English, Todd Drydock, Inc., Seattle, has been made president of the Purchasing Agents Association of Seattle, succeeding C. C. Mueller, of A. M. Castle & Co., whose term expired.

W. R. Mitchell, who has for some time been in charge of the Detroit office of the National Acme Co., Cleveland, has been elected vice-president of that company and will be located in Cleveland after July 1. Before being transferred to Detroit he was superintendent of the company's Cleveland plant.

Gordon L. Edwards has been elected treasurer of the United States Steel Corporation, New York, to succeed the late F. M. Waterman. Mr. Edwards

has been associated with the Steel Corporation since its inception, having begun work in the office of the treasurer shortly after his graduation from high school. Subsequently he was made a clerk in the treasurer's office and later assistant to the treasurer. After the death of Richard Trimble in April, 1922, and Mr. Waterman's appointment to succeed him as treasurer, Mr. Edwards and John H. Gewecke were made assistant treasurers. The latter now becomes first assistant treasurer. In 1901 he also began work as an office boy, and like Mr. Edwards has been steadily advanced in the Corporation. Both men are members of the American Iron and Steel Institute.



GORDON L. EDWARDS

W. T. Shannon, district sales manager at Cincinnati for the American Sheet & Tin Plate Co., retired from active service June 1 at the age of 70 years. He had been associated with the company in the above capacity since its formation. Prior to 1900 he was sales representative at Chattanooga, Tenn., for the Apollo Iron & Steel Co. When that company became a part of the American Sheet Steel Co. he was transferred to Cincinnati as district sales manager. At the formation of the American Sheet & Tin Plate Co. he was retained in the same position. L. K. Slaback has been appointed Mr. Shannon's successor. Mr. Slaback became associated with the American Sheet Steel Co. when that company established an office at Cincinnati in 1900, continuing his affiliation when the American Sheet & Tin Plate Co. was formed. In 1922 he was made assistant district sales manager.

Clarence H. Beach, district sales representative of Bliss & Laughlin, Inc., Chicago, has been elected chair-

man of the Indianapolis chapter, American Society for Steel Treating. During the past two years he has served as secretary-treasurer. Other officers elected for the coming year are A. T. Haggerty, metallurgist, Muncie Products Division, General Motors Corporation, Muncie, Ind., vice-chairman; James S. Marlowe, J. S. Marlowe Co., Indianapolis, secretary; and Edward J. P. Fisher, metallurgist, Diamond Chain & Mfg. Co., Indianapolis, treasurer.

I. C. Wyant, formerly a salesman in the reinforcing bar department of the Jones & Laughlin Steel Corporation at Chicago, is now in the sales department of the Barton Spiderweb System, Inc., Chicago, dealer in reinforcing bars.

Theodore F. Mersales, president Montgomery Ward & Co., Chicago, resigned June 1, to become president of the Johns Manville Corporation, New York. He will succeed H. E. Manville, who has been elected chairman of the board.

C. W. Greenfield, treasurer Stocker, Rumely, Wachs Co., Chicago, machine tool dealer, sailed June 1 for a seven weeks' visit to Europe. F. C. Schreiber has become associated as a machine tool salesman for the Stocker, Rumely, Wachs Co., 117 North Jefferson Street, Chicago.

O. P. Palmer, assistant purchasing agent New Departure Manufacturing Co., Bristol, Conn., has been made purchasing agent to succeed W. A. Kimball, who has taken a year's leave of absence on account of ill health.

A. H. Moore, chairman standardizing committee, General Electric Co., Schenectady, N. Y., has announced his retirement, effective Aug. 1, following 39 years of service with the company and its associated foreign manufacturing organizations. He will be succeeded on the standardizing committee by S. H. Blake.

Wallace Clark, consulting engineer, New York, has received the commanders' cross of the Order of Poland Restored for his services in the reorganization of the tobacco and salt monopolies of Poland. He is active in the work of the management division of the American Society of Mechanical Engineers, and was the engineer member of the Kemmerer Finance Commission which visited Poland in 1926 at the invitation of the Polish Government.

John Lyle Harrington, of Harrington, Howard & Ash, consulting engineers, Kansas City, Mo., and a past president of the American Society of Mechanical Engineers, has been elected to the board of trustees of Robert College, Constantinople, Turkey. He has been active in the behalf of the school's engineering college for a number of years.

Henry H. Knapp, chief accountant, Wickwire plant, Wickwire Spencer Steel Co., Inc., Buffalo, has been elected president of the Buffalo chapter, National Association of Cost Accountants.

Jacob Zoeller, representing the Tonwerk der Stadt Klingenberg, Klingenberg, Germany, producer of fire and refractory clay of the same name, arrived in this country on June 3, and will make his headquarters with Adolphe Hurst & Co., Inc., 30 Church Street, New York, selling agent in the United States for Klingenberg products.

A. O. Woerner, for the past seven years in the sales department of the Scullin Steel Co., St. Louis, has been appointed assistant vice-president of the company, effective June 1.

J. M. Brown has been added to the Pittsburgh sales force of the Surface Combustion Co., 366 Gerard Avenue, New York, and will specialize in combustion burners for blast furnaces and for boilers using blast furnace or mixed gas. He is a graduate of the University of Pittsburgh and a post-graduate of the Carnegie Institute of Technology. Following service in

the metallurgical department of the Carnegie Steel Co., Pittsburgh, he was employed in a similar capacity by the Trumbull Steel Co., Warren, Ohio, and later was associated with the American Heat Economy Bureau in the sale and installation of automatic control equipment for open-hearth furnaces, blast furnace stoves and boilers. Mr. Brown succeeds H. T. Watts in the Combustion company, the latter having been appointed plant engineer for the Gulf States Steel Co., Birmingham.

Charles A. Levine, who accompanied Clarence D. Chamberlin on the Bellanca airplane "Columbia," in the flight from New York to Klinge, Germany, within about 60 miles of Berlin, was identified with the steel scrap business for a number of years. In 1919 and 1920 he operated the Peerless Iron Pipe Exchange, Long Island City, N. Y., dealing in new and used pipes and tubes. In 1920 the Columbia Salvage Corporation, 233 Broadway, New York, was formed with Mr. Levine chairman of the board of directors. This corporation handled a large tonnage of shells and shell steel for the Government in 1921 to 1922. About 1923 Mr. Levine was interested in the purchase and subsequent resale of the Pardee Steel Corporation, Perth Amboy, N. J. The Columbia Air Craft Corporation was formed in 1926 with offices at 233 Broadway, New York, and early this year Mr. Levine became chairman of the board. The corporation as yet has no plant, the Bellanca airplane having been built by the Wright Aeronautical Corporation of America at Paterson, N. J. Early this year Mr. Levine was interested in the company which unsuccessfully bid for the Government contract to operate the air mail service. Mr. Levine, who is about 30 years of age, was born in North Adams, Mass., and has been interested in aviation for some years.

C. P. Perin, Perin & Marshall, consulting engineers, New York, has sailed for a few weeks' trip in Europe.

George J. Hagan has become associated with the Pittsburgh sales office of the Surface Combustion Co., New York, and will specialize in billet heating furnaces and kindred equipment.

## OBITUARY

EDWIN S. JACKMAN, who died in Santa Barbara, Cal., on May 30, was born in East Liverpool, Ohio, April 11, 1865. He moved to Allegheny City, Pa., in



EDWIN S. JACKMAN

1871, attending the public schools there and for a short time was a student at the Western University, now the University of Pittsburgh. His first work was in a telegraph office and through it he was offered a place in the office of Park, Brother & Co., Ltd., in 1882. William G. Park, then the leader in the fine steel industry, quickly recognized his ability and started him in sales work. He was transferred from Pittsburgh to New England, then to Philadelphia and later to the West. In 1887 he became Western manager for Howe, Brown & Co. After establishing their business in the West,

he returned to the Park organization as manager of its Western business, remaining until the organization of the Crucible Steel Co. of America in 1900.

In that year Mr. Jackman became agent for the Firth-Sterling Steel Co., operating as E. S. Jackman &



Co., with headquarters in Chicago. Starting in a very small way, he built a business and organization which spread from Pittsburgh to the Pacific Coast. Mr. Jackman was an idealist in business, with ability as a writer that would have given him recognition in the literary field had he turned to it. At a time when the business world was most interested in efficiency methods and machines, he published "Firth-Sterlingism," featuring the human element in business. When it was popular to malign the railroads, he published his widely quoted "Tribute to the American Railroads and the Men Who Run Them." Before there was a Federal Trade Commission, he took a firm stand against unfair competition in business and worked persistently to wipe out all the practices which had made selling synonymous with drinking and extravagant entertaining. His whole career was an effort to interpret in practical form high ideals in character development while building a sound, profitable business. His fondness for books took the place of every other form of recreation and, although not a member of many clubs or social organizations, his acquaintance was large and his generous nature led to many friendships in business, artistic and literary circles.

FRANK N. BRAYER, president and general manager of the Co-Operative Foundry Co., Oswego, N. Y., died at his home in that city on June 2, aged 72 years. He was born at Oswego, and early in life became associated with his father in the foundry business. In 1901 he succeeded his father as president of the Co-Operative company. In 1896 he helped to organize the American Foundrymen's Association, becoming a charter member.

WILLIAM H. ST. JOHN, president Green Bay Drop Forge Co., Green Bay, Wis., died suddenly on May 30 at Escanaba, Mich., where he had gone on a business visit. He was 55 years of age.

GEORGE W. GALBRAITH, sales manager at Cincinnati for the Worthington Pump & Machinery Corporation, New York, died June 2, aged 66 years. He was a member of the American Society of Mechanical Engineers and of the Cincinnati Engineers' Club.

CHARLES CARTWRIGHT, a pioneer in the American iron and steel industry, died in Youngstown on June 4. He was one of the founders of Cartwright, Curty & Co., which in 1874 built what later became the Lower Union mills of the Carnegie Steel Co. Previously he had been identified for several years with the Cambria Iron Works, Johnstown, Pa., in association with William Jones, Capt. R. W. Hunt, John Fritz and Powell Stackhouse. During the Civil War he had charge of the Government mill established at Chattanooga, Tenn., for re-rolling rails. He was 97 years old.

HENRY E. RUSSELL, former president of the Russell & Erwin Mfg. Co., New Britain, Conn., died at his home in New London, Conn., on June 3, aged 88 years. He had retired from the Russell & Erwin company 23 years ago after having spent his entire business life with the company.

JOHN H. MACALPINE, who was a prominent contributor to the fund of marine engineering knowledge, the developer of a balanced marine engine and joint inventor with Admiral George W. Melville of the Melville-Macalpine floating-frame reduction gear, died at Mount Vernon, N. Y., May 31. He was born in Paisley, Scotland, Nov. 3, 1859, and attended Glasgow University. From 1879 until 1912 he was active in marine engineering work on both sides of the Atlantic, most of that time in the United States. Since 1912, he had been engaged in consulting work and in writing. He was the author of articles and papers on the balancing of engines and vibrations of steamships; the inertia stresses of reciprocating engines and of elastic valve gears; on reduction gears, of which he was an advocate of the floating-frame type, and on the geared turbine versus the turbo-electric system of marine propulsion. He was a member of the Society of Naval Architects and Marine Engineers, New York; Institution of Engineers and Shipbuilders in Scotland, Glasgow; Institution Naval Architects, London; Edinburgh Mathematical Society, National Marine League, Academy of Science and Art, Pittsburgh; associate member American Society Naval Engineers, and a trustee Bucknell University, Lewisburg, Pa.

## Steel Plant Uses Electric Furnaces

(Concluded from page 1667)

coupling to a worm gear, which drives one of the hoisting drums through a pinion mounted on the shaft of the worm wheel. A solenoid brake is mounted on each section, between the worm gear and the main coupling in the center. The effect therefore is that of a continuous shaft with a driving motor, gears and brakes at each end. The two hoisting drums are so located that their driving gears are parallel. While under normal conditions they do not make contact, in case of failure of a drum pinion, shaft or worm gear on either end of the main shaft they will make contact, so that the solenoid brake on the section of the shaft which is still operative can hold both drums stationary, and prevent the load from dropping.

In this case, as in that of the charger, the two elements of the worm gears are mounted on tapered roller bearings, the arrangement being the same as that described on the charger. The rest of the drives on the crane are of the spur gear variety, the trolley being driven by a 40-hp. motor through two sets of gears, and the bridge travel mechanism by two 90-hp. motors. The bridge has double compensating trucks, with a total of eight wheels at each end, two of which are driving wheels. All the motions are completely equipped with tapered roller bearings, a total of 342 being used.

Advantages claimed for the combination of tapered roller bearings and worm drive on the crane are the

same as those for the charger, as regards simplicity, ease of operation and saving in lubrication and maintenance expense. There is, however, an additional advantage in that, in the case of worm drive, no ratchets or ratchet equalizing gears are required.

Apparatus in the mill building consists of the 125-ton stripper crane, 5-ton soaking pit crane, 35-in. blooming mill, 10 x 10-in. hot shears, and a 20-ton crane for handling the billets in and out of the annealing pits. The principal feature of interest in this installation is the fact that many of the bearing installations represent the first ones ever made to their particular classes of service. For instance, on the stripper crane, the tongs turning shaft and stem thrust bearing are of the tapered roller variety, as are those on the tongs turning lower sheave shaft, operating shaft and operating sector. The trolley wheels, main hoist, drumshaft, reduction shafts, sheave and motor back shaft extension are similarly equipped.

On the blooming mill, which is a three-high, 35-in. mill, the top and bottom screwdowns are driven by a 1500-hp. induction motor. All the rolls of the mill approach table, and those of both lifting tables, are equipped with Timken bearings. The side shafts of both the mill approach and the lifting tables are similarly equipped. The same is true in the case of the shear approach and depressing table rollers, and the shear approach and depressing table side shafts.

# Machinery Exports Largest in Years

April Ahead of March, Which Was Best  
Month Since 1921—Imports  
Large in April

WASHINGTON, June 2.—Maintaining their increasing trend, exports of all machinery in April, 1927, were valued at \$39,793,078 as against \$38,915,857 in March, each in turn being the largest month for several years. For April, 1926, total exports of all machinery were valued at \$38,689,933. For the four months ended April, 1927, the total was \$141,716,512 as against \$140,771,951 for the corresponding period of last year.

Exports of industrial machinery likewise set a record for several years, in April. As classified by the Division of Statistics, the April total was \$18,996,495, while the total given by the Industrial Machinery Division for its more restricted classification was \$17,338,727, the largest for any month during the past five

years. The April total, as given by the Industrial Machinery Division, showed a gain of \$1,461,000 over the shipments of April, 1926, the previous high point. The March, 1927, total, as given by this division, was \$13,949,000, while the total of the Division of Statistics was \$17,728,393.

Exports of all power-driven metal-working machinery in April, 1927, were valued at \$1,798,880, against \$1,326,260 in March; \$1,471,519 in April, 1926; \$5,740,523 during the four months ended in April, 1927, and \$4,951,691 for the corresponding period of 1926. Items listed in THE IRON AGE table of exports of power-driven metal-working machinery represented 734 machines, valued at \$1,065,501, in April, compared with 905, valued at \$754,503 in March.

## Machinery Exports from the United States

	(By Value)		Four Months Ended	
	April, 1927	April, 1926	April, 1927	April, 1926
Locomotives.....	\$89,749	\$116,240	\$3,541,821	\$2,077,198
Other Steam Engines.....	104,038	348,346	818,381	358,812
Boilers.....	135,298	138,862	669,187	609,175
Accessories and Parts.....	237,944	165,534	754,255	533,896
Automobile Engines.....	1,590,781	1,602,995	4,733,249	5,742,604
Other Internal Combustion Engines.....	656,218	833,531	1,919,277	2,717,813
Accessories and Parts.....	298,161	428,499	1,414,009	1,419,331
Electric Locomotives.....	312,485	434,561	438,284	1,345,551
Other Electric Machinery and Apparatus.....	682,795	672,185	2,865,955	2,387,812
Excavating Machinery.....	466,801	931,907	1,547,019	1,903,083
Concrete Mixers.....	99,890	53,473	408,211	250,105
Road-Making Machinery.....	251,303	172,992	621,115	627,575
Elevators and Elevator Machinery.....	422,638	234,253	1,626,490	1,751,722
Mining and Quarrying Machinery.....	1,520,063	1,902,403	4,743,448	5,994,258
Oil-Well Machinery.....	2,861,219	1,201,582	7,553,485	5,330,949
Pumps.....	628,487	591,368	2,134,259	2,181,057
Bending and Power Presses.....	123,443	101,335	381,749	290,228
Forging Machinery.....	53,357	107,688	277,953	414,209
Power-Driven Metal-Working Machinery (a).....	1,065,501	716,863	3,354,066	2,448,380
Other Metal-Working Machinery and Parts.....	489,868	500,870	1,510,402	1,609,530
Textile Machinery.....	949,554	1,134,210	3,512,397	4,081,232
Sewing Machines.....	926,028	991,034	3,258,420	2,954,664
Shoe Machinery.....	148,368	98,353	469,639	408,327
Flour-Mill and Gristmill Machinery.....	37,733	105,955	133,729	332,577
Sugar-mill Machinery.....	281,223	313,852	909,636	978,935
Paper and Pulp-Mill Machinery.....	220,132	257,370	738,616	869,444
Sawmill Machinery.....	230,192	97,966	1,687,720	928,811
Other Woodworking Machinery.....	84,108	116,281	414,923	436,082
Refrigerating and Ice-Making Machinery.....	645,049	404,799	1,176,808	(b)217,437
Air Compressors.....	709,182	448,101	1,916,214	1,646,450
Typewriters.....	2,069,992	1,736,853	7,178,916	7,005,194
Power Laundry Machinery.....	147,151	233,318	574,604	565,943
Typesetting Machines.....	443,786	307,454	1,355,476	1,299,050
Printing Presses.....	431,142	286,036	2,056,042	2,569,749
Agricultural Machinery and Implements.....	8,049,039	8,572,687	26,910,674	33,642,922
All Other Machinery and Parts.....	12,330,360	12,330,177	48,109,783	42,841,846
Total.....	\$39,793,078	\$38,689,933	\$141,716,512	\$140,771,951

(a) Details in separate table.

(b) Refrigerating equipment over 10 tons capacity only.

## Imports of Machinery Into the United States

	(By Value)		Four Months Ended April	
	April		April	
	1927	1926	1927	1926
Metal-working machine tools.....	\$20,735	\$14,874	\$165,152	\$143,756
Agricultural machinery and implements.....	758,635	855,890	2,588,110	2,141,193
Electrical machinery and apparatus.....	180,885	82,361	513,457	308,161
Other power-generating machinery.....	2,252	1,814	22,187	4,348
Other machinery.....	630,318	682,316	2,649,411	3,174,138
Vehicles except agricultural.....	247,338	187,577	744,650	728,461
Total.....	\$1,840,163	\$1,824,832	\$6,682,967	\$6,500,957

## United States Exports and Imports of Machinery

	Exports of Machinery		Exports of Power-Driven Metal-Working Machinery
	Exports of Machinery	Imports of Machinery	
The year 1924.....	\$317,040,424	\$9,711,618	\$8,644,444
The year 1925.....	385,376,676	11,577,911	13,052,916
1926			
January.....	34,590,693	1,685,580	1,206,125
February.....	32,269,707	1,476,598	1,294,934
March.....	35,241,960	1,714,234	1,297,616
April.....	38,755,467	1,814,021	1,479,337
May.....	32,707,863	1,494,156	1,004,298
June.....	30,498,054	1,484,127	1,024,252
Fiscal year.....	398,306,436	15,413,144	16,046,267
July.....	34,123,992	1,327,874	1,318,556
August.....	32,459,844	1,453,909	1,326,443
September.....	36,901,003	1,432,378	1,145,406
October.....	27,965,148	1,247,115	1,069,343
November.....	32,694,793	1,210,868	1,274,446
December.....	32,140,569	1,373,234	1,202,069
The year 1926.....	400,167,883	17,137,056	14,315,695
1927			
January.....	33,433,429	1,640,177	1,495,455
February.....	29,575,096	1,483,713	1,121,256
March.....	38,915,857	1,540,356	1,326,260
April.....	39,793,078	1,840,163	1,798,880
Ten months.....	337,726,524	14,553,486	13,078,228
Four months.....	141,716,512	6,682,967	5,740,523

## Exports of Power-Driven Metal-Working Machinery

	April, 1927		March, 1927	
	No.	Value	No.	Value
Engine lathes.....	61	\$99,763	44	\$65,332
Turret lathes.....	15	44,564	15	50,150
Other lathes.....	27	45,530	35	35,308
Vertical boring mills and chucking machines.....	10	33,994	5	12,622
Thread-cutting and automatic screw machines.....	105	112,789	63	68,007
Knee and column-type milling machines.....	22	44,152	11	32,537
Other milling machines.....	46	86,755	27	81,457
Gear-cutting machines.....	29	77,186	62	52,738
Vertical drilling machines.....	20	25,979	56	12,738
Radial drilling machines.....	8	16,674	18	19,625
Sensitive drilling machines.....	61	9,600	58	8,880
Other drilling machines.....	54	19,397	266	9,702
Shapers and slotters.....	40	76,370	49	69,057
Planers.....	3	6,850	2	7,500
External cylindrical grinding machines.....	100	207,263	49	119,363
Internal grinding machines.....	53	116,995	25	81,241
Metal-working tool-sharpening machines.....	80	41,640	120	28,246
Total.....	734	\$1,065,501	905	\$754,503



Imports of machinery listed in THE IRON AGE table were valued at \$1,840,163 in April, against \$1,540,356 in March. In April, 1926, they were valued at \$1,824,832. For the four months ended April, 1927, they were valued at \$6,682,967, against \$6,500,057 for the corresponding period of 1926. Imports of industrial machinery in April of the present year were valued at \$1,416,558, compared with \$1,224,298 in April, 1926. For the four months ended April, 1927, the value was \$5,372,930, compared with \$5,488,990 for the corresponding period of last year.

Charts prepared by the Industrial Machinery Division show that exports of industrial machinery are being maintained on a considerably higher level than at any time since 1921.

Shipments of oil-well machinery during April, 1927, totaled \$2,861,219 or considerably more than double those for the corresponding month of 1926. A comparison of the four-month period ended in April of each year shows a gain of more than \$2,200,000. The types of metal-working machinery which have made the strongest gain during the four months of 1927 include external cylindrical grinding machines, internal grinding machines, shapers, slotters and engine lathes.

Shipments of construction and conveying machinery during April decreased by \$442,000 as compared with the corresponding month of 1926, the latter having been unusually large. The most striking change in this

group was the drop in exports of dredging machinery from \$609,858 to \$24,554 for April, and from \$882,488 to \$118,698 for the four months ended April 30. Cranes and swinging booms gained during the month but declined over the longer period from \$296,386 to \$131,570. Shipments of concrete mixers, on the other hand, increased both for the month and for the four-month period, the advance in the latter case being from \$250,105 to \$408,211.

Exports of textile machinery showed a loss of \$185,000 for April, 1927, and \$469,000 for the four-month period. It has been pointed out that this decline is not peculiar to the present year, but has been going on steadily for the past four years. Exports of cotton-spinning and twisting machines to Germany during the period of January-April decreased from \$219,019 in 1926 to \$43,196 in 1927, while exports to China fell from \$154,224 to \$1,180. As a consequence, total shipments of cotton-spinning and twisting machines dropped from \$455,266 to \$96,193 during these periods.

Fifteen locomotives, valued at \$89,749, were exported in April, of which seven, valued at \$44,781, went to Canada and a like number, valued at \$42,188, went to Mexico. For the four months ended in April 112 locomotives, valued at \$3,541,821, were exported. Of this number, 49, valued at \$2,348,918, went to Brazil; 19, valued at \$110,558 to Canada and 13, valued at \$95,810, to Mexico.

## Where Our Imported Scrap Comes From

Imports of scrap into the United States are mainly from Canada. Cuba and the United Kingdom are the two other leading sources of supply. The figures in the table show that Canada furnished 53 per cent of our scrap imports in the calendar year 1926, and almost precisely 50 per cent in the first four months of 1927. Mexico and Panama, which between them sent nearly 16,000 tons in 1926, had dropped to a bare 30 tons (from Mexico) in the first four months of this year.

Imports of Scrap Into the United States  
(Gross Tons)

Countries of Origin	Calendar Year 1926	Four Months Ended April 30, 1927
Belgium .....	83	742
Denmark .....	2,326	...
Germany .....	974	125
Netherlands .....	1,500	...
Norway .....	35	...
Sweden .....	520	142
United Kingdom .....	8,869	6,761
Europe .....	14,307	7,770
Canada .....	45,838	10,552
Honduras .....	1	...
Panama .....	7,748	...
Mexico .....	8,004	30
Newfoundland .....	1	...
Jamaica .....	2	...
Other British West Indies .....	403	...
Cuba .....	10,400	2,188
Virgin Islands .....	3	...
Chile .....	11	...
Algeria and Tunisia .....	7	...
French West Indies .....	...	123
America .....	72,418	12,890
British India .....	...	520
Total .....	86,725	21,180
Average month .....	7,227	5,295

## More Steel Barrels Made

Production of steel barrels in April, reported by 28 companies to the Department of Commerce, represented 599,771 units, compared with 575,850 in March and with 602,058 in April last year. The current figure is the highest since last June. Shipments ran 1½ per cent ahead of production in April, offsetting a slight shortage in March. The stocks at the end of the month were 50,070 barrels, compared with 59,389 on April 1.

Unfilled orders, which have been declining since a peak was reached at the end of December, called for delivery of 296,395 barrels within 30 days and 1,069,160 in a longer period. The total of 1,365,555 is a drop of almost 500,000 in four months. It is higher, however, than the total of 1,279,159 a year ago.

Business booked during April by members of the

Steel Barrel Manufacturers Association amounted to \$1,150,217. Total shipments included 371,493 barrels, of which New Jersey as usual took the largest number, with 129,421. Pennsylvania and New York followed in that order. There were no export shipments. Capacity was engaged during the month to the extent of 51.5 per cent; I. C. C. barrel capacity was occupied only 23.6 per cent, while capacity for light barrels was used at 59.4 per cent.

## Shipments of Sheet-Metal Ware

April shipments of galvanized sheet-metal ware, as reported to the Department of Commerce, were 232,496 doz., valued at \$841,902. This shows a substantial gain from the March total of 213,672 doz., valued at \$790,371. For the first four months of the year, total shipments have been 821,897 doz., valued at \$3,044,919. This represents a large increase from the first four months of 1926, when shipments were 697,011 doz., valued at \$2,825,093.

Enameled sheet-metal ware shipped in April amounted to 337,181 doz., valued at \$1,192,808. This is a sharp drop from the March totals of 440,671 doz., and \$1,484,420.

## Coal Consumption Slackens

April coal consumption, which amounted to 38,600,000 tons, as estimated by the National Association of Purchasing Agents, was a drop of more than 10 per cent below March, which was the previous lowest month of the year. Stocks of coal on hand in industrial establishments, May 1, are estimated at 72,288,000 tons, a drop of more than 5,000,000 tons from 77,455,000 tons April 1. This latter figure is the largest ever recorded. Production in April is estimated at 43,109,000 tons, of which 35,775,000 tons was bituminous coal and 7,334,000 tons anthracite.

Stocks on hand at the end of April are estimated as equivalent to a 56-day supply, compared with 54 days at the end of March and less than 45 days at the end of each of the preceding 14 months.

## Commission Transfers Export Section

WASHINGTON, June 7.—The Federal Trade Commission has transferred the work of its export trade division to its legal division. A new section of the legal division has been created and designated the export trade section, and the chief counsel has been assigned to have direct supervision of the new section and the administration of the Webb-Pomerene, or Export Trade, act.

# German Export Rebates Increased

Mills Well Booked with Domestic Orders—Sheet Users Protest at Home Prices Higher Than Foreign—British Advance Bar Iron

(By Cable)

LONDON, ENGLAND, June 7.

Pig iron is quiet after the holidays, consumers not being attracted to extensive purchasing by the latest price reductions. Stocks of iron are accumulating and further damping of furnaces is under consideration. Foreign ore continues quiet.

Finished steel is generally inactive, although inquiry is improving. Plate demand is poor, but structural material is moving in moderate volume. Japan is inquiring for bridge and shipbuilding material.

Staffordshire marked bar iron has been reduced 20s. (\$4.85) per ton to £13 10s. (\$65.47) per ton. Scotch Crown iron bars have been reduced 10s. (\$2.42) to £10 15s. (\$52.13) per ton.

The Clyde shipbuilding output in May was 24 ves-

sels of 26,700 tons. Contracts placed during May aggregate 50,000 tons.

Tin plate is quiet and more mills are closing. Works outside the South Wales Corporation and Baldwins are contemplating the formation of single selling groups and a committee formed to discuss the question.

Galvanized sheets are quiet. Black sheets for Japan are moderately active but other foreign markets are dull.

Continental iron and steel prices are strong, although business is only moderate. English users of semi-finished material are buying sheet bars, but billet consumers are well stocked.

French production in April was: Pig iron, 774,000 metric tons; steel, 680,500 tons. Stewarts & Lloyds, Ltd., has been licensed to manufacture tubes at Vereeniging, South Africa.

## German Deliveries Extended—Export Rebates Increased

(By Radio)

BERLIN, GERMANY, June 6.

Market activity continues with steel works fully occupied. There is a distinct shortage of supplies in semi-finished material, structural steel and sheets and delivery terms of mills are lengthening. Demand for building construction and shipbuilding materials is heavy.

The export markets are still dull, but the Stahlwerks Verband reports a general tendency toward improvement with international market prices on a slightly higher level.

Domestic prices for June are unchanged. Price rebates given by the German Steel Syndicate to exporting manufacturers are established for June on a higher basis. This is the first change in these rebates made since the March schedule, which was retained unaltered for April and May.

The new export refunds are as follows per metric

ton: Ingots and blooms 23 m. (\$5.45) for June, compared with 20 m. (\$4.74) for March; billets and slabs 26 m. (\$6.16) for June and 20 m. (\$4.74) for March; bars 42 m. (\$9.95) for June and 34 m. (\$8.05) for March; shapes 39 m. (\$9.24) for June and 33 m. (\$7.82) for March; heavy sheets 27 m. (\$6.40) for June and 23.50 m. (\$5.57) for March.

The Federation of German Industries states that the recent report that Great Britain is about to enter the International Steel Cartel is erroneous.

## German Exporters Oppose Direct Sales by Tube Cartel

HAMBURG, GERMANY, May 21.—Establishment by the German Tube Syndicate of its own sales offices at Cape Town, South Africa, Bombay, India, and in several other overseas markets has developed strong opposition from exporters, as these offices are selling direct to consumers at the same prices quoted to the exporters. Although the syndicate originally claimed that

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

Durham coke, del'd.	£1 2s.	to £1 2½s.	\$5.33	to \$5.46
Bilbao Rubio ore f.	1 2	to 1 2½	5.33	to 5.46
Cleveland No. 1 fdy.	3 12½		17.57*	
Cleveland No. 3 fdy.	3 10		16.97*	
Cleveland No. 4 fdy.	3 9		16.73*	
Cleveland No. 4 forge	3 8½		16.61*	
Cleveland basic	3 15	to 3 15½	18.18	to 18.30
East Coast mixed	3 19	to 3 19½	19.15	to 19.27
East Coast hematite	4 0½		19.52	
Rails, 60 lb. and up.	7 15	to 8 5	37.58	to 40.01
Billets	7 5	to 7 10	35.16	to 36.37
Ferromanganese	12 0		58.20	
Ferromanganese (export)	11 15		56.98	
Sheet and tin plate bars, Welsh	6 5		30.31	
Tin plate, base box	0 19	to 0 19½	4.60	to 4.66
Black sheets, Japanese specifications	14 0	to 14 5	67.90	to 69.11
C. per Lb.				
Ship plates	7 12½	to 8 0	1.65	to 1.73
Boiler plates	11 0	to 11 10	2.38	to 2.49
Tees	8 5	to 8 15	1.78	to 1.89
Channels	7 10	to 8 8	1.62	to 1.73
Beams	7 5	to 7 15	1.57	to 1.68
Round bars, ¾ to 3 in.	8 0	to 8 10	1.73	to 1.84
Steel hoops	10 10	to 11 0	2.28	to 2.39
Black sheets, 24 gage	11 5		2.44	
Galv. sheets, 24 gage	14 12½	to 14 15	3.17	to 3.19
Cold rolled steel strip, 20 gage, nom.	14 0		3.03	

\*Export price, 6d. (12c.) per ton higher.

†Ex-ship, Tees, nominal.

## Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)					
Belgium	£3 3s.	to £3 4s.	\$15.27	to \$15.52	
France	3 3	to 3 4	15.27	to 15.52	
Luxemburg	3 3	to 3 4	15.27	to 15.52	
Basic pig iron:					
Belgium	3 2½	to 3 3	15.15	to 15.28	
France	3 2½	to 3 3	15.15	to 15.28	
Luxemburg	3 2½	to 3 3	15.15	to 15.28	
Coke	0 18		4.37		
Billets:					
Belgium	4 10	to 4 11	21.82	to 22.06	
France	4 10	to 4 11	21.82	to 22.06	
Merchant bars:					
Belgium	4 17	to 4 17½	1.07	to 1.08	
Luxemburg	4 17	to 4 17½	1.07	to 1.08	
France	4 17	to 4 17½	1.07	to 1.08	
Joists (beams):					
Belgium	4 17½	to 4 18	1.08	to 1.09	
Luxemburg	4 17½	to 4 18	1.08	to 1.09	
France	4 17½	to 4 18	1.08	to 1.09	
Angles:					
Belgium	4 17		1.07		
¼-in. plates:					
Belgium (nominal)	6 7		1.39		
Germany (nominal)	6 7		1.39		
¾-in. ship plates:					
Belgium	5 17		1.28		
Luxemburg	5 17		1.28		
Sheets, heavy:					
Belgium	6 2		1.34		
Germany	6 2		1.34		

(a) Nominal.



these offices were to handle only special tubing, they are evidently selling gas pipe and other ordinary tubes. As a result, a large proportion of the German exporters are showing preference for the quotations of foreign tube mills, in the belief that the syndicate has become their direct competitor for foreign business.

The price war recently instituted by the International Tube Syndicate, directed at forcing the Polish mills to join the association, does not seem to be producing the desired result. Despite the policy of syndicate members of quoting less than Polish mills, regardless of costs, the Polish mills reached a record figure in exports of tubes in April, shipping a total of about 4000 tons, compared with average monthly exports of 3200 tons in the first quarter of the year and 2700 tons a month in the past 12 months. An additional difficulty is presented by the recent completion of a modern tube mill in Czechoslovakia, the Jakels Eisenindustrie A. G., which also refuses to join the tube syndicate. As a result of this development added to the refusal of Poland to join the syndicate, competition is increasing and prices are developing considerable weakness.

## GERMAN UNEMPLOYMENT LESS

### Scrap Consumption Greater Than Pre-War— Machinery Market Active

BERLIN, GERMANY, May 19.—The recent announcement of a restriction of credits by the banks brought about a decline in steel and coal stock quotations on the bourse and there has been no material recovery with the money market tighter. As a result of this financial condition, it is believed that certain steel corporations, which had intended to issue new shares of stock in the Berlin bourse, will try to float their new issues in New York. Economic conditions are generally healthy, which is borne out by statistics of unemployment. On May 1, the total unemployed in Germany was 871,000 compared with 1,745,000 in January. Among members of the Metal Workers' Labor Union the number of unemployed was 11.1 per cent in April compared with 15.7 per cent in January. The improvement is still greater since April.

The syndicate prices on pig iron and steel for June continue unchanged. Iron and steel scrap prices are firm and available supplies small, despite continuation of the export prohibition on scrap. It is noteworthy that the present annual consumption of scrap is 7,000,000 tons, compared with 5,600,000 tons in 1913, the comparison being based on the same national areas.

### Mills Not Seeking Export Orders

There are increasing domestic sales of pig iron and the majority of steel works are booked with business for the next 90 days. Recent reports that no steel exports would be made in the next few months are denied, but it is admitted that in most instances mills are at present but little interested in foreign business. Demand for semi-finished steel is showing continued increase and the market on bars, sheets and wire is satisfactory. The domestic tube market is active and a large order was recently booked for tubes to be shipped to the Russian oil corporations. The output of iron and steel in April shows a considerable increase from the figures of April, 1926. Production of pig iron was 1,051,872 metric tons compared with 668,211 metric tons in April of last year; steel output 1,288,000 tons compared with 867,968 tons in April, 1926, and rolling mill production 1,009,143 tons compared with 762,862 tons in April of last year. In April of this year there were 113 of the total of 196 blast furnaces in operation, while in April, 1926, there were only 80 of a total of 112 in blast. The daily output of pig iron per furnace is being increased and Dusseldorf producers expect that in the next few months still further improvement will be recorded.

### Machinery Business Good

The latest monthly report of the Machine Manufacturers' Association records a satisfactory condition of business. In some branches of the machinery business the demand for labor exceeds the supply. The

largest present purchasing is of machine tools, textile and paper mill machinery and printing machinery. Buying of agricultural machinery continues small and in some products is declining with prices, particularly export quotations, considered by makers to be too low. There has been a slight improvement in the locomotive business. The Julius Berger Construction Co.'s negotiations with Turkey for railroad construction in Anatolia have been practically concluded. Including railroad work to be undertaken in Rumania, the company has contracts to the total value of 180,000,000 m., which will keep it occupied for the next four to five years.

### Cartel Renewals Negotiated

The Locomotive Construction Syndicate, the agreement on which expired Jan. 31 of this year and was provisionally renewed until April 30, is continuing negotiations for reestablishment of the syndicate. Negotiations for the formation of an International Wire Rod Cartel have been successful but the agreement has not yet been signed. The cartel is expected, however, to be operative by July 1. It is understood that Germany's quota will be 60 per cent of the total membership output, the remaining 40 per cent of production being distributed among the French, Belgian and Luxemburg members.

Efforts to establish a thin sheet syndicate continue to encounter obstacles. In consequence of this failure, the chain of special syndicates, subordinate to the German Steel Syndicate is incomplete. Difficulty has been encountered in bringing into accord the interests of companies which are exclusively rolling mill operations with the so-called mixed companies producing all kinds of iron and steel products.

## GERMAN SHEETS HIGH

### Export Trade Reduced by High Costs— American and British Prices Lower

HAMBURG, GERMANY, May 29.—Manufacturers of stoves, enamel ware, buckets and other products for which black sheets lighter than No. 22 gage are used, are demanding lower prices from German mills as a necessity to continuation of their export business. It is pointed out by the consumers that mills have been steadily decreasing the export price of black sheets and at the same time increasing the domestic quotations. These reductions were largely in the thinner gages to enable the mills to compete with British, French and Belgian mills in overseas markets, particularly India, China and Japan. As a result, German manufacturers, paying higher prices for their raw materials have found it increasingly difficult to compete with their finished products in these and other foreign markets, so that there has been a distinct downward trend in their exports.

Consumers of sheets, as a result of this situation, are emphasizing the necessity for increased importation of thin gage British and American black sheets, which when used for the manufacture of products for export may be imported free. The difference in price of the German sheets and the foreign product is considerable on the thin gages. For No. 22 gage the American price is \$1 per ton higher than the German domestic quotation and the British 10c. per ton higher, and on No. 23 gage the American price is 15c. per ton higher and the British price \$2 per ton lower. On the gages Nos. 24 to 30, both the American and British quotations are less than the German. The following comparison shows the amount in dollars per ton that American and British sheets are lower than German domestic prices:

Gage	United States	Great Britain
No. 24.....	\$3.10	\$5.20
No. 25.....	6.60	7.20
No. 26.....	11.00	11.60
No. 27.....	14.40	12.70
No. 28.....	18.20	17.10
No. 29.....	20.80	18.60
No. 30.....	23.80	20.40

That these differences in price have reacted to the advantage of imported sheets seems evident from the fact that the percentage of exported articles made from imported sheets increased from 8.4 per cent in February

to 11.4 per cent in April. It seems probable that a still greater increase will be shown in the exports since April as the difference between the price of the German and foreign sheets is greater today than in March or April.

## JAPANESE SHEET MILLS SOLD

### Kawasaki Interests Go to Two Companies— British and German Sheet Prices

NEW YORK, June 7.—According to recent cable reports to Japanese exporters, the absorption of the Kawasaki Dockyard Co. by the Mitsui and Sumitomo interests is practically completed, Mitsui & Co. taking the dockyard and Sumitomo, the sheet mills, locomotive works and aeroplane factory. Mitsui & Co. are understood to have been offered the entire Kawasaki assets, but refused all but the dockyard, in the belief that operation of the other units might affect their present status as agents for Japan on certain brands of sheets and makes of locomotives.

Japanese business continues quiet and very little inquiry is before the market at present. Although American mills are understood to be quoting light gage black sheets for Japan at about \$80 per ton, c.i.f. Japanese port, British sellers are offering the thin gages at £15 8s. 6d. (\$74.80) per ton, c.i.f. Japan, and the German maker is quoting £15 6s. 6d. (\$73.32) per ton, c.i.f. A recent inquiry by the Mei Densha Engineering Works and the Hitachi Engineering Works for a total of 150 tons of electrical steel sheets, which are generally purchased by Japanese companies from American mills, brought out a low bid for the business from the Japanese agent of Joseph Sankey & Sons, Ltd., Bilston, England. Bids were opened June 2 and 3 by Tokio municipality on 280 tons of 91-lb. high T-rails and 150 tons of 100-lb. girder rails.

### Steel Importers Report Good Business

In most cases importers of European steel for American consumers report fairly active demand for small lots of material. Prices of the imported product continue quite firm at 1.70c. per lb. base on plain steel bars of Thomas grade. While most of the current business is in lots of 50 to 100 tons of bars, beams and shapes, there are reported to be a few sizable contracts on which importers have submitted bids. The recent tendency in public works to insist upon the use of open-hearth steel bars instead of Thomas steel has placed importers dealing with German mills in a stronger position than formerly. In most instances, French, Belgian and Luxemburg mills show but little interest in quoting on open-hearth material, but German producers with a rapidly increasing capacity in open-hearth steel are apparently in a position to compete successfully for such contracts. The open-hearth product is generally quoted by the German mills at 5c. to 10c. per 100 lb. advance from the Thomas steel base.

The order by the Brooklyn authorities prohibiting the use of foreign made beams in the construction of buildings in that borough has apparently been temporarily surmounted by some erectors, who are reported to have continued the use of the imported beams following rigid tests to determine that they conform in every particular to the American specifications and the city building code.

## Krupp Makes Stainless Wire Rods

HAMBURG, GERMANY, May 21.—The new stainless steel developed by Friedrich Krupp A. G. under the trade name of "Widia" is being furnished in the form of rustless iron wire rods. It is claimed by the maker that wire drawn from these rods may be used as a substitute for non-ferrous and alloy steel wire. In addition it is claimed to be particularly satisfactory in drawing thin gages, drawing through diamonds, which has been the practice on wire finer than SWG 30, not being necessary with this alloy. A further advantage claimed for use of "Widia" wire rods is the lower cost of the finished product as a result of almost total elimination of waste caused by occasional breaking of the wire, which often occurs in drawing the fine gages.

## FRENCH PRICES WEAK

### Mills Claim Market Has Reached Bottom— Export Fair

PARIS, FRANCE, May 20.—Business is still depressed, apparently because of lack of confidence in the stability of the franc and the attitude of consumers that as there is no prospect of an early revival of business, there is no necessity for building up stocks. Under normal conditions, declining prices bring out some business, but recently, reductions have been ineffective in stirring the market to activity. Present prices on iron and steel are considered by producers to be as low as possible in view of costs. It is pointed out that iron and steel are now proportionately cheaper, based on the pre-war prices, than any other commodities.

In the export field there is slightly more optimism, as German mills are evidently showing a considerably lessened interest in foreign business, being well booked with tonnage for their domestic market. The recent report that the German Steel Syndicate would not seek export business for several months (later denied by the syndicate) had a desirable effect on the steel market in Brussels. Immediately following publication of this report, sellers adopted a firmer attitude and export quotations temporarily advanced from 2s. to 4s. (48c. to 97c.) per ton. A few products, such as bars and semi-finished material, suddenly became scarce, producers in several instances refusing to quote, on the assumption that the market might show still greater improvement.

**Pig Iron.**—Domestic demand may have shown some improvement, as is claimed in some quarters, but the action of producers in reducing prices for June delivery does not reflect any substantial activity on the part of domestic consumers. Only 30,000 tons of foundry iron has been placed at the disposal of consumers for June. Belgian furnaces have dropped their domestic quotations to the level of the French price, but in the export market, French, Belgian and Luxemburg producers are maintaining their prices unchanged. In consideration of the quietness of the market and recent evidence of British competition in hematite iron, the hematite iron producers reduced their price for domestic delivery of forge iron by 20 fr. (78c.) per ton and foundry iron by 10 fr. (39c.) per ton. An allotment of 30,000 tons for June and a tentative allotment of 20,000 tons for July shipment were set aside. Negotiations for a closer entente, which would control export allotments of the members are being continued by the French, Belgian and Luxemburg furnaces, but the question of allotments and their basis, is still an obstacle.

**Semi-Finished Material.**—The market is quiet with blooms quoted at £4 3s. (\$20.12) per ton, billets at £4 8s. (\$21.34) per ton and sheet bars at £4 11s. to £4 12s. (\$22.05 to \$22.30) per ton.

**Finished Material.**—Domestic demand for beams is light so that the lowest possible price at the present level of the market has not been developed, as there have been no large tonnages closed recently. For export beams are quoted at £4 13s. 6d. to £4 16s. (\$22.67 to \$23.27) per ton and merchant bars at £4 13s. (\$22.55) per ton, f.o.b. Antwerp. Sheets are more active in both the domestic and export markets. For export, 5 mm. steel sheets and heavier gages are quoted at £6 (\$29.10) per ton, compared with a price a week ago of £5 17s. 6d. (\$28.36) per ton.

## New Blast Furnaces Largest in Germany

HAMBURG, GERMANY, May 21.—The two blast furnaces being built by the Mannesmann Rohrenwerke of Düsseldorf, at Huckingen, will have the largest capacity of any in Germany. The estimated daily production will be 770 tons for each furnace. The largest blast furnaces in Germany at present are at the Thyssen works in the Ruhr, which has three with an average daily output of 710 tons. The new Mannesmann furnaces are expected to be in operation late this year or early in 1928.



## Available Ore Supply Is Limited

(Continued from page 1659)

Georgia and Tennessee. With ore, fuel and flux within a few miles of each other, Birmingham can make iron at an exceptionally low cost; transportation is at an almost irreducible minimum. But the Lake Superior reserves, though but slightly more than those of these Southern States, are drawn upon ten times as fast. This is due to a difference in the character of population and of industry. At the present rate of consumption Lake ores will last one-eleventh as long as those of the region of which Birmingham is the center. When the former are consumed will Birmingham supply the deficiency for the North and West? By no means. The reserves are not interchangeable; geography attends to that.

New York State contains something like a thousand million tons of ore, part of which must be beneficiated before smelting, part of which is the so-called Clinton hematite, such as are the bulk of the Birmingham ores. Indeed, the appellation, Clinton, is in recognition of the fact that these ores were first known in quantity in the vicinity of the New York town of that name. Ores of New York, whatever their nature, and those of the neighboring New Jersey highlands, serve a comparatively small and restricted market. It will be hard to widen that field, especially in the face of increasing foreign competition. To do so there must be more furnaces and steel mills east of the natural barrier of the Alleghenies, but the great market for finished and semi-finished steel is now established in western Pennsylvania, Ohio and Illinois, across the mountains.

Utah and the Far West, the Intermountain region and the Pacific slope, also have iron ore in quantity far greater than their own needs will require for a long time to come. These ores are rich in iron and are easily mined; they are out of the question as a possible reserve to be drawn upon when Lake Superior begins to lose place as the chief producer. They are too far away, both from furnaces and wide markets, and there are no waterways.

Texas and Missouri possess iron ores centrally located and easily mined. Most of this is what is known as brown ore, good, but unsuited to be the basis of an industry of magnitude. In such an occupation as steel making there must be a backlog of known tonnage sufficient in quantity and suitable in quality to warrant the considerable investments necessary; owing to their mode of occurrence it is very difficult to estimate tonnages in brown ore deposits. It is practically certain that these States contain many hundred million tons of this class of ore, scattered over thousands of square miles, but the engineer is rash who will attempt to make figures of tonnage in any given deposit before it has been mined out. Then, too, these ores are not now favored by large producers except as a minor portion of their furnace burden.

### Peak of Production in Lake Region Near

THEREFORE, the future of the United States as a great steel-making nation rests rather definitely on the reserves of the Lake Superior region, and especially on those of the Mesabi range. Tax rolls show this region to have one and a half billion tons of commercial ore; probably it will mine nearly twice as much. In the past 10 years it has supplied steel makers with more than half a billion tons, to be more exact, 510,000,000 gross tons. With no consideration of any increases and taking into account probable as well as assured ores, it can maintain an annual production of 50,000,000 tons for 60 years. It cannot be doubted that there will be a gradual increase in demand; in the decade, 1903 to 1913, the total was 383,000,000 tons instead of 510,000,000. Before that the region actually had doubled its production every 10 years. Excessive demand due to war requirements accounts for part, probably about half, of the increase of the last 10 years; without war we might not have grown more than 15 per cent in the decennial period ending last year.

Particularly, the future rests with the Mesabi range, that great storehouse of medium-grade, easily mined and transported ore lying near the lake in northern

Minnesota. It supplies 65 per cent of all the ore going to furnaces that depend for their supply on the Lake region. In the past ten years it has shipped an average of 35,000,000 tons a year. It has in sight a billion and a quarter tons of commercial ore, with comparatively slight probabilities for additions to this class of ore. Without increase of mining this may last theoretically 40 years.

Curves have been plotted showing the probabilities for the future of this range and of the Lake district as a whole. They show that the summit of annual production has not been attained, but that it may be reached within the next few years. Then will begin a slow and gradual decline, continuing for a long time, as the curve flattens to its end. As the mines approach exhaustion, tonnage will be harder to secure, shipments must diminish, and extraction will be more costly. This is a condition inherent in the nature of ore deposits everywhere.

Twenty years from now, at the latest, the miner producing ore for the chief steel-making centers of the United States will have established himself, for at least a share of his raw material, elsewhere than on the now productive areas of the Mesabi range. Where will he locate? Incidentally, what sweeping change may this bring about in the iron and steel business as a whole?

### Much of Lake Deposits Not Amenable to Beneficiation

GEOLOGISTS tell us that there are 30 billion tons of ore formation material on the Mesabi and 72 billion in the entire Lake Superior region. They leave us with the impression that all this is amenable to beneficiation commercially. They picture the Mesabi, for example, as a cake of this lean material in which are scattered the raisins of minable ore deposits. But this cake would be a very thin diet for a blast furnace, and most of it is quite indigestible in a mill designed for its beneficiation or concentration. The mechanical treatment of an ore to improve its quality to an extent that will fit it for economical smelting is a method of separating minerals that are not chemically combined, and is done either by taking advantage of weight or flotation differences, or of marked divergences in magnetic permeability. There are washing plants around Lake Superior that utilize chiefly differences in weight; one company takes advantage of both weight and magnetic attractability. Where the various minerals forming an iron ore are combined chemically they cannot be separated except chemically, and that means the laboratory of the blast or other furnace. As iron in the ore diminishes this sort of work rapidly becomes too expensive. Most of the iron in the vast mass of rock in the Lake region is too weak in magnetic permeability to permit successful separation by magnets; much of it is of varieties in which the chief impurities are chemically combined. Roughly speaking, the Mesabi is divided into two unequal zones; the line of division is near Embarrass Lake, which is well to the eastern end of the exposed portion of the range. To the east of this lake the material is largely magnetite, westerly it is preponderantly hematitic. We cannot look forward to the time when this larger volume of hematite iron can be separated mechanically as a commercial undertaking; indeed, much of it is utterly impossible of such separation.

But naturally, all predictions of this nature have a string to them. Discoveries in methods of separation, cheapening of processes now used, unexpected chemical shortcuts, revolutionary changes in accepted smelting devices—all such are possible, no doubt, although it must be said that except for a gradual cheapening of processes through experiment these changes seem a long way in the future, too far off to be seriously considered. The blast furnace is an efficient laboratory, chemistry an exact science. For generations men have studied methods of ore separation. Such methods must not only be adroit, but they must be cheap, especially in the case of ores of so low a unit value as iron.

### Possibilities for Concentrating Lean Ores Are Limited

SOME very minor share of the hypothetical 72 billion tons of ore formation material in the Lake district, together with large quantities on the Canadian side in Ontario, undoubtedly is suitable for beneficiation on a

commercial scale. That has been proved by work under way for some years. In all probability some part of the present output of direct-shipping, commercial iron ore will be replaced gradually by ores that are mechanically enriched to the point where they will become satisfactory to the furnace manager. Such mechanical treatment is slow and expensive, however. What nature has accomplished in eons of time we cannot do in a day without a corresponding expenditure of energy. Plants for this enrichment are costly, and the product they can make will call for such installations of machinery that time must elapse before they can replace even individual mines, such as Hull-Rust, Mahoning, Norrie or Newport on the Lakes, Red Mountain in Alabama, or others elsewhere.

Potential iron ores reported from various parts of the world may or may not equal expectations of those interested in them or their development. There is no question that in many cases they are "a far Monadnock softened to a gem." Only those potentialities are worthy of consideration that are both large and within reach. Last year there was much excitement in western Canada over reports of extensive discoveries of iron in the interior of Saskatchewan. Even had these reports been true the ore would have been useless, not only for today but for as long into the future as man can project his horizon. Lack of markets and a long and costly rail haul would have prevented exploitation indefinitely. The Norwegian coast from the Arctic Circle for 600 miles north and east around to the Russian frontier is composed of iron-bearing rocks.

There is water transport and almost unlimited opportunity for cheap electric power. There are the markets of continental Europe and the British Isles. But the two impressive experiments made there in iron ore mining have not yet added greatly to European supplies. It always has been supposed that China possessed vast stores of iron. However, the most recent and thorough investigations made by the geological survey of that country are distinctly disappointing. The results of these investigations have been published within the last few months. Available ores are scarce except in the case of Manchuria. It has lean ores, held by the Japanese. On the other hand, the United Kingdom has possibilities amounting to several billion tons, all in ores poor in iron but still capable of use perhaps by those adept English iron masters. Germany hopes to add a couple of billion tons to her reserves, so shrunk by the loss of lands in war. Poor ores, but usable at need. France is already far and away the richest iron ore nation in Europe and has additional potentialities equal in tonnage to those of England and better in quality. Some of these will be available and some will not. Nearly all are quite low in iron and quantities of them are not readily subject to beneficiating treatment.

So far as may now be judged, the United States will remain the chief iron and steel-making country so long as we can mine commercial ore, beneficiate that too lean for direct smelting, or can discover new fields. The opportunity for new finds of great consequence seem rather remote.

## Canadian Steel and Power Show to Feature Many Papers

Twenty of the 61 manufacturers who have contracted for space in the Steel and Power Show, to be held in the University of Toronto Arena, Aug. 31, Sept. 1 and 2, announce their intention of showing their products in operation. It is predicted that the show will be the most comprehensive and interesting in Dominion history. Displays to be in operation include machine and electrical tools, industrial furnaces, pulverized fuel equipment, electric arc and oxy-acetylene welding apparatus, recording instruments, tube cleaners, valves, traps, etc.

The technical session program arranged is unusually comprehensive, dealing with practically every phase of metal working, heat treating, and power generating. With the addition of speakers on materials handling, and abrasive and refractory materials, the technical addresses will include:

F. S. Collings, mechanical engineer, Sargent & Lundy, Inc., Chicago: "Burning Coal in Pulverized Form."

J. F. Lincoln, Lincoln Electric Co., Cleveland: "Redesign of Present Riveted and Cast Structures to the Use of Arc Welding and Structural Steel."

F. A. Combe, consulting engineer, Montreal: "Rational Boiler Plant Design for Low-Cost Steam."

Charles M. McKergow, professor of mechanical engineering, McGill University, Montreal: "Value of Everyday Test Information to Power Plant Executives."

Melvin F. Thomas, consulting engineer, Toronto: "Heating Buildings."

H. H. Moss, research engineer Linde Air Products Co., New York: "Oxy-Acetylene Welding."

C. A. Thinn, research engineer C. A. Dunham Co., Marshalltown, Iowa: "Reducing Overheating by Controlling Steam."

O. W. Ellis, research metallurgical engineer Westinghouse Electric & Mfg. Co., East Pittsburgh: "Developments of the Last Ten Years from the Physics-Metallurgical Viewpoint."

M. P. Whelen, industrial heating engineer, Toronto Hydro-Electric System: "Low-Temperature Electric Heating."

M. Barry Watson, director of engineering, Central Technical School, Toronto, and chairman, Ontario Section, American Society of Mechanical Engineers: "Water Softening."

B. Stuart McKenzie, secretary Canadian Engineer-

ing Standards Association: "What Standardization Can Do for Canadian Industry."

L. M. Arkley, professor of mechanical engineering, Queen's University, Kingston: "Heat Insulation as a Money Saver."

L. T. Rutledge, associate professor of mechanical engineering, Queen's University: "Machine Design in the Metal-Working Industry."

Robert W. Angus, professor of mechanical engineering, University of Toronto: "External and Internal Combustion of Liquid Fuels."

Charles McKnight, research department, International Nickel Co., New York: "Canada World Pioneer in Locomotive Boiler Development."

W. H. Eisenmann, secretary American Society for Steel Treating, Cleveland: "Benefits Industry Derives from A. S. S. T. Endeavors."

R. B. Morley, general manager Industrial Accident Prevention Associations, Toronto: "Accident Prevention Profitable to Industry."

T. Holland Nelson, T. H. Nelson & Co., Conshohocken, Pa.: "Recent Development and Application of Chromium Irons and Steels in the Fields of Corrosion and Heat Resistance."

W. S. Quigley, president Quigley Furnace Specialties Co., New York: "High-temperature cement versus fire clay for brick construction, how to use old furnace linings, plastic mixtures of crushed old fire brick and high-temperature cement, repairing furnace linings, baffle construction and repairs, making special shapes, 'shooting' plastic mixture for repairs."

C. L. Ipsen and R. Otis, General Electric Co., Schenectady, N. Y.: "Gas, Oil and Electric Furnaces."

## Electric Melting Furnaces

During 1926 there were 27 electric melting furnaces installed in the United States, according to a statement made by George H. Schaeffer, chairman of the electric heat committee of the Association of Iron and Steel Electrical Engineers. The total rated tonnage was 125.5, giving an average of 4.65 tons per furnace. Only three furnaces exceeded 10 tons, these being of 25 tons each. Two of these large furnaces and one 7-ton furnace were installed at the Timken plant, Canton, Ohio, as detailed at page 1665. Of the furnaces under 25 tons each, the average was only 2.1 tons.

One furnace was of  $\frac{1}{4}$  ton, 5 of  $\frac{1}{2}$  ton each, one of  $\frac{3}{4}$  ton, four of 1 ton, four of  $1\frac{1}{2}$  tons, one of 2 tons, six of 3 tons, one of 7 tons, one of 10 tons, and 3 of 25 tons.



# Machinery Markets and News of the Works

## SALES FALL OFF

### Orders for Single Machines from Diversified Sources Predominate

#### Baldwin Locomotive Works Makes Inquiry and Westinghouse Company Issues Quarterly List

A FAIR amount of inquiry is before the trade, but inquiries received during the week did not, in most districts, add much to the total of pending business. In Cincinnati, however, they are reported as of good volume, and an increase in bookings during the remainder of the month is expected. In general, sales during the week have been light.

An outstanding new inquiry is that of the Baldwin Locomotive Works, for 44 electric traveling cranes and 12 crane bridges for its new Eddystone, Pa., plant. Some large machine tools are also included in the list.

## New York

NEW YORK, June 7.

THE largest inquiry in the market is from the Baldwin Locomotive Works, Eddystone, Pa., for equipping a new erecting shop for which contracts were recently awarded. A large part of the inquiry consists of 44 electric traveling cranes and 12 crane bridges, but some large machine tools are also being bid on. The American Smelting & Refining Co., New York, has issued a small list for a machine shop in Newfoundland. In general, machine tool business is quiet, the first few days of this month having brought out no great amount of business. Among orders reported are the following: Two duplex hand centering machines to a New Jersey motor company; a profiling machine to an aircraft manufacturer; a single-spindle drilling machine to a Connecticut manufacturer; a thread milling machine and a tool makers' lathe to an ignition company; a profiling machine to an adding machine manufacturer in Illinois; a vertical shaper to a Detroit motor car company; a 12-ft. heavy-duty boring mill to a Milwaukee company; a 60 x 48-in. x 14-ft. planer to a York, Pa., manufacturer; a 90-in. locomotive axle journal turning lathe to the Union Pacific Railroad.

Contract has been let by the Robins Dry Dock & Repair Co., 25 Broadway, New York, to the Tilt-Hargan Co., for a one-story boiler and plate shop at its yard at 1075 Beard Street, Brooklyn, 63 x 110 ft., estimated to cost \$90,000 with equipment.

Ovens, power equipment, conveying and other machinery will be installed in the two-story plant to be erected on Sterling Place, Brooklyn, by Cushman's Sons, Inc., 1819 Broadway, New York, for which bids will soon be asked. It is estimated to cost more than \$100,000. George Dress, 161 East 121st Street, New York, is architect.

The Empire Architectural Iron Works, Inc., Randall Avenue and Truxton Street, New York, has concluded negotiations for the purchase of property on Craven Street, for a new plant. It is said that plans will be drawn soon and bids asked.

Alimendinger & Schlendorff, 852 Monroe Street, Brooklyn, architects, have completed plans for a two-story automobile service, repair and garage building, 58 x 100 ft., to cost \$85,000 with equipment.

The third quarter list of the Westinghouse Electric & Mfg. Co., East Pittsburgh, comprising about 60 items, is another feature of the week. A small list for a machine shop in Newfoundland has also been issued by the American Smelting & Refining Co., New York.

The city of Boston is inquiring for a small number of lathes, some tool room equipment and some wood-working machinery for three schools. An inquiry for 12 speed lathes, made some time ago by the Chicago Board of Education, is active.

In the automotive field, the Cadillac Motor Co. has placed a small amount of new equipment, and the Ford Motor Co., which is preparing to manufacture its new model, is expected to purchase considerably more machinery. Purchasing by the railroads appears to be virtually at a standstill. Orders on the Santa Fe list are being placed slowly.

In some districts, particularly in Boston, the market in used machine tools has been active.

The Walter Motor Truck Co., Queens Boulevard, Long Island City, has leased the building of the Boyce & Veeder Co., Inc., on the Queens Boulevard, for expansion. The leasing company is now operating a plant at Farmingdale, L. I., for the manufacture of fire extinguishers, etc.

The Phelps Dodge Corporation, 99 John Street, New York, has work under way on a new lead smelting and refining plant at Douglas, Ariz., reported to cost in excess of \$300,000 with equipment.

The Ford Motor Co., Detroit, will carry out an expansion and improvement program at its branch plant at Green Island, near Troy, N. Y., including changes and equipment installation for the manufacture of gear-shift automobiles instead of planetary gear cars, as heretofore.

Ovens, power equipment, conveying and other mechanical apparatus will be installed in the seven-story plant, 92 x 147 ft., to be erected by the F. H. Bennett Biscuit Co., 137 Avenue D, New York, to cost \$400,000. J. Edwin Hopkins, 41 Park Row, is architect.

Officials of the Remington Arms Co., Inc., 25 Broadway, New York, have organized a subsidiary, the Remington Service Machines, Inc., to take over and expand the plant and business of the Universal Sales Machine Co., 104 Portland Street, Boston, manufacturer of vending machines and parts. It has contracted with the National Lead Co., 111 Broadway, for the production of certain small parts, including die-castings, used in the machines, and the latter company will make necessary additions in equipment and facilities to carry out this manufacture. John B. Smiley, head of the Remington Arms Co., will be president of the new company; Arthur H. DuGrenier, heretofore president of the Universal company, will continue with the new organization.

The Brooklyn & Queens Screen Mfg. Co., 1576 Bushwick Avenue, Brooklyn, has plans under way for a new two-story factory, to cost \$60,000 with equipment.

J. M. Felson, 250 West Fifty-seventh Street, New York, architect, has filed plans for a seven-story automobile service, repair and garage building, 100 x 150 ft., at 239-49 West Sixty-sixth Street, to cost upward of \$600,000 with equipment.

The Cook & Swan Co., Inc., 66 Beaver Street, New York, manufacturer of refined oils, has plans for a three-story storage and distributing building at Elizabeth, N. J., to cost approximately \$65,000.

The Western Electric Co., 195 Broadway, has awarded a general contract to Fred Kilgus, Inc., 13 South Sixth Street, Newark, for proposed additions to its telephone equipment.

and cable plant at Kearny, N. J., consisting of a five-story unit, with floor area of 69,000 sq. ft., and one-story structure, about 11,000 sq. ft. of floor area, to cost \$328,000. The extensions will be equipped primarily for the manufacture of lead-covered cables. The company also has work in progress on a new six-story unit, for the manufacture of telephone equipment.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, has filed plans for a one-story substation at its electric generating plant on the Hackensack River, Jersey City, N. J., to cost about \$90,000. It will also build a one-story equipment storage and distributing plant unit at this station, estimated to cost \$75,000. Plans have been completed for a two-story power substation at Paterson, N. J., to cost approximately \$100,000 with machinery.

The Seeley Tube & Box Co. 344 Central Avenue, Newark, N. J., manufacturer of paper boxes and containers, spiral tubes, cardboard packages, etc., has leased two floors in the east wing of the factory of the L. E. Waterman Co., 140 Thomas Street, for the establishment of a new plant. The present works will be removed to the new site and additional equipment installed.

The International Harvester Co., 608 South Michigan Avenue, Chicago, has arranged for a new factory branch, service and distributing works for its motor truck division at 220 Elizabeth Avenue, Newark, to be operated in conjunction with its similar branch at Long Island City.

The Logan-Long Co., 37 West Van Buren Street, Chicago, manufacturer of roofing products, has leased property at 145 Willard Street, Garfield, N. J., and will establish a new factory branch.

The Harry Schneider Co., 1225 Broadway, New York, has been appointed exclusive sales agent in the United States and other export countries by the Compagnie Generale de L'Industrie, Brussels, Belgium, a combination of 24 manufacturers in Belgium. Included are iron and steel products, such as cast iron pipe and fittings, steel rails, building materials, window and plate glass, lead sheets, aluminum sheets, lead pipes and other non-ferrous metals, paints and lighting fixtures.

The Absorption Refrigerator Co., Inc., 51 East Forty-second Street, New York, has been organized as a subsidiary of the Seryel Corporation to manufacture Electrolux refrigerating machines. Manufacturing will be carried on at Newburgh, N. Y., and the company may be addressed at that place.

Sinnock-Bachofner, Inc., 9 Orchard Street, Newark, has been organized to deal in and refine precious metals and their alloys. A plant will not be built at present and the company is not in the market for equipment.

The Shur-Loc Elevator Safety Corporation, 62 West Forty-fifth Street, New York, has been organized to succeed the Shur-Loc Elevator Safety Co., Inc., and has begun the production of a line of apparatus having to do with the operation and safety of the elevator shaft door. The older company had been devoting itself only to safety of doors. The factory at 102 Murray Street, Newark, N. J., will be adequate for present operations, and no new material or equipment will be purchased.

The Electro Novelad Corporation, 250 Park Avenue, New York, has been organized to manufacture electrical advertising devices, particularly a sheet metal turntable for window displays. The company has a plant in operation at Newark and is not in the market for materials.

The Sterling Automatic Machinery Co., Inc., New York, has been organized to manufacture coin detecting devices and ticket vending machines and expects to be in the market for materials and equipment in about a month. It may be addressed in care of Meyer H. Lavenstein, 209 West 146th Street, New York.

The K. A. P. Motor Car Corporation, 57 Bay Street, St. George, Staten Island, is planning the erection of a new service, repair and sales building to cost in excess of \$100,000 with equipment.

The National Bearing Metals Corporation, 30 Church Street, New York, has been organized to manufacture brass and bronze bearings, composition castings, journal bearings and other products.

Consolidated net income of the Great Northern Iron Ore Properties, 32 Nassau Street, New York, for the year ended Dec. 31, 1926, amounted to \$2,287,907. Undivided surplus as of the same date totaled \$1,600,235. After disbursements of 75c a share on April 30 and Dec. 28, 1926, aggregating \$2,250,000, and book entry adjustments of \$195,701, the company had undivided surplus and receipts on Dec. 31, 1926, of \$1,833,842. Since September, 1906, the company has made 34 distributions to holders of certificates of beneficial interest, the total disbursements amounting to \$58,500,000.

## New England

BOSTON, June 6.

USED machine tools, following a lull, have been more active than new machines the past week in this territory, one local house reporting the sale of \$25,000 worth of used equipment to a Vermont shop. Other sales included three fairly large tools to a western Massachusetts firm, a 12-in. lathe and three small drills to a local plant, and several single machines, mostly lathes and drills, the aggregate for the week making a fairly good showing. No sales of new tools of importance are noted, but dealers are working on a number of old inquiries that give promise of closing shortly.

Fresh inquiries for new equipment show a further shrinkage, the largest being from the city of Boston for a small number of lathes for the Winslow school, at Brighton, wood-working equipment for the Quincy school, Tyler Street, and some tool room equipment for the new Dorchester high school for boys, bids for which close June 9. A New England street railroad company is expected to close soon on a radial drill under negotiation since February, and there is a prospect of a Boston shop closing on another radial drill within a few days.

Sales of small tools so far this month are running well in excess of those in the corresponding periods in May and April.

Work will start at once on a one-story, 40 x 64 ft., shop and tramways for the Smalley Granite Co., 89 Penn Street, Quincy, Mass., Plans are private.

The Underwood Machinery Co., 110 Mount Vernon Street, South Boston, has the general contract for a coal bunker for the Arlington Gas Light Co., Arlington, Mass.

The Trimont Bottling Co., 300 North Street, Boston, is taking bids for a one and two-story plant at Everett, Mass., for which conveying equipment and motors are required. M. J. Mastrange, 369 Hanover Street, Boston, is the architect.

Fire last week damaged the foundry of the Federal Iron Works, Charles and First Streets, Cambridge, Mass. In the event of rebuilding practically all new equipment will be required.

The Torrington Co., Torrington, Conn., has purchased the business of the Chicago Handlebar Co., Shelby, Ohio, manufacturer of handlebars and seat posts, and will move the equipment to the Torrington company's branch plants. Bicycle pedals, spokes, nipples, etc., will be made in addition to handlebars and posts.

The International Silver Co., Meriden, Conn., has plans for a one-story shop addition, 30 x 70 ft., at its branch plant at Bridgeport, Conn. Work will begin at once.

The City Hall Square Garage Co., East Elm Street, Brockton, Mass., is completing plans for a two-story service, repair and garage building, to cost about \$100,000 with equipment. F. A. Norcross, 46 Cornhill Street, Boston, is architect.

The Athol Mfg. Co., Chestnut Hill Avenue, Athol, Mass., plans extensions and betterments in its electric power department, including the installation of a new generating unit and auxiliary equipment.

S. D. Warren Co., 101 Milk Street, Boston, is planning the erection of a two-story addition to its paper mill at Westbrook, Me., 150 x 200 ft., to cost more than \$500,000 with equipment, including improvements in the present plant.

The City Council, Pawtucket, R. I., has had plans completed for a municipal garage, machine and repair shop, and storage building for the Department of Public Works, and will begin work soon.

The Wellesley Colonial Garage, Inc., Wellesley, Mass., has plans for a new two-story service, repair and garage building, 105 x 140 ft., to cost close to \$30,000 with equipment. Blackall, Clapp & Whittemore, 31 West Street, Boston, are architects.

The Perkins Machine & Gear Co., Springfield, Mass., has closed negotiations for the purchase of the former plant of the Springfield Body Co., West Springfield, in financial difficulty for several months. The purchase includes buildings and land, but no equipment, and was made for \$75,000. The new owner is arranging for the removal of its present plant to the new location, and will provide increased equipment and facilities for the manufacture of cut gears, etc., including assembling. The company is closely affiliated with the Chapman Valve Co., Indian Orchard, Mass. A. W. Gilbert is president of both companies; Dr. E. C. Gilbert, vice-president; and John J. Duggan, treasurer.

The Massachusetts Auto Repair Co., 93 Willow Street, South Boston, has filed plans for a new one-story plant, 84 x 100 ft., at Dorchester, to cost close to \$50,000 with equipment.



## Pittsburgh

PITTSBURGH, June 6.

**T**HE interesting feature of the week in the machine tool market is the appearance of the third quarter list of the Westinghouse Electric & Mfg. Co., which contains about 60 items. As a whole, machine tool business is slow and new inquiries comparatively few.

The Richmond Radiator Co., Uniontown, Pa., has acquired the patents and rights of manufacture of the Heatomat gas boiler, heretofore produced by the United Utilities & Engineering Corporation, 2220 Chestnut Street, Philadelphia, and will arrange facilities to handle production at the Uniontown works. A. A. Marks, formerly president of the United Utilities organization and designer of the boiler, has become associated with the Richmond company as director of the gas boiler division, which will be developed by the company to include other specialties.

The Holland Furnace Co., Seventh and Bigelow Streets, Pittsburgh, has plans for a new one-story plant at 1111-29 Behan Street, to cost close to \$50,000 with equipment.

The Pittsburgh Coal Co. and Associated Companies, Oliver Building, Pittsburgh, are said to be planning the construction of a new steel tippie at their mining properties in the vicinity of Bridgeville, Pa., also the installation of other machinery. Operations are being abandoned at the Essen, Pa., mines, and production will be transferred to the Mansfield and Bridgeville properties.

The National Bearing Metals Corporation, Pittsburgh, care of the Keystone Bronze Co., Thirty-ninth Street and Allegheny Valley Railroad, a new organization, has acquired the property of the Keystone company at the corner of Foster and Thirty-ninth Streets, 107 x 450 ft., and on Thirty-eighth Street, 107 x 185 ft., and 100 x 105 ft., improved with factory buildings, and will establish a plant at that location.

The Huntington Boiler Works, Inc., Huntington, W. Va., has plans for a one-story addition, 70 x 110 ft., for boiler and plate department expansion.

The Pardee & Curtain Lumber Co., Clarksburg, W. Va., has plans for a new mill at Bergoc, W. Va., to cost in excess of \$350,000 with machinery. A power house will be built. The company operates the West Virginia Midland Railroad system from Webster Springs to Holly Junction, and proposes to extend the line from the first noted place to Bergoc.

The Phillips Gas & Oil Co., Butler, Pa., has completed plans for a new compressor plant in the vicinity of Sprinkle Mills, Pa., to cost close to \$50,000 with equipment.

## South Atlantic States

BALTIMORE, June 6.

**B**IDS will be asked soon by the Summers Fertilizer Co., Stock Exchange Building, Baltimore, for a new three-story plant to cost \$275,000 with machinery. It will replace a works destroyed by fire several weeks ago. A. N. Ingram, Stock Exchange Building, is architect and engineer. J. E. Totman is president.

The Virginia Electric & Power Co., Richmond, Va., formerly the Virginia Railway & Power Co., has arranged for a bond issue of \$3,000,000, a portion of the proceeds to be used for extensions and improvements. Harry H. Hunt is chairman of the board.

The United States Coast Guard, Washington, is asking bids until July 1 for two turbo-electric ship propulsion sets and other electrical and mechanical equipment.

The City Council, Salisbury, Md., contemplates the installation of pumping machinery and other power equipment in connection with extensions and improvements in the municipal waterworks and sewage system, for which an appropriation of \$200,000 has been approved. F. H. Dryden is engineer.

The Barnum-Bruns Iron Works, Inc., Norfolk, Va., is completing arrangements for a new plant for the manufacture of ornamental iron specialties. The main shop will be 50 x 65 ft. Other buildings are contemplated at a later date.

The State Board of Welfare, Union Trust Building, Baltimore, has awarded a general contract to the Davis Construction Co., 9 West Chase Street, for a three-story shop at the local Maryland House of Correction, to cost \$81,000 with equipment. Theodore W. Pietsch, American Bank Building, is architect.

The Denmark Machine & Foundry Co., Denmark, S. C., has inquiries out for three Hamilton type Corliss engines, 18 x 36 in.; 16 x 42 in., and 16 x 36 in., respectively, with accessories.

The Winston Heading Co., Winston, N. C., will rebuild the portion of its mill recently partially destroyed by fire. Additional equipment will be installed, including heading saws; one steam-fed cut-off saw carriage, with 72-in. saw; 150-hp. boiler with accessories; heading planer, grinder for circular

saws; generator and other power equipment, transmission equipment, including shafting, pulleys, etc.

The General Mica & Clay Co., Atlanta, Ga., care of D. D. Rice, Atlanta National Bank Building, has acquired mica properties in the vicinity of Franklin, N. C., and plans the installation of mining and power equipment as well as refining machinery. The entire project is reported to cost in excess of \$85,000.

The Chesapeake Paper Board Co., Key Highway, Baltimore, will soon take bids on a general contract for a one-story addition, including alterations and improvements in present mill, to cost close to \$100,000 with equipment.

The City Council, Greensboro, N. C., plans the installation of pumping machinery and other power equipment in connection with proposed extensions and improvements in the municipal waterworks. A bond issue of \$500,000 is being arranged.

The McDonald Service Co., 614 South Tryon Street, Gastonia, N. C., has taken over property at Franklin Avenue and Marietta Street, 100 x 150 ft., and plans the erection of a one-story machine and repair shop and service works.

The Frederick County Products Co., Inc., Frederick, Md., recently formed with a capital of \$150,000 to take over local property, is planning enlargements in its ice-manufacturing plant and the installation of additional machinery.

The James McGraw Co., Richmond, Va., has been appointed sales agent in Richmond and vicinity for the Climax Engineering Co., Clinton, Ohio.

The Southern Saw Service Co., 1594 Evans Drive, S. W., Atlanta, Ga., has established a plant for the manufacture of meat saws, sausage mill blades and special devices for markets. The company will also maintain a saw blade grinding department. W. S. Anderson is owner and manager.

The Dixie Horseshoe Mfg. Co., Inc., Tallapoosa, Ga., recently organized, has acquired the building formerly occupied by the Chattanooga Bottle & Glass Mfg. Co., and is establishing a plant for the manufacture of horseshoes. It will have a daily capacity of from four to five carloads. Electrically operated equipment is being installed and production is expected to begin within 90 days. H. E. Jackson, formerly with the United States Horseshoe Mfg. Co., will be manager.

## Philadelphia

PHILADELPHIA, JUNE 6

**C**ONTRACT has been let by the Heintz Mfg. Co., Front Street and Olney Avenue, Philadelphia, manufacturer of steel automobile bodies, to the William Newberry Co., Otis Building, for a one-story addition to its machine shop, to cost about \$25,000 with equipment.

H. A. Weymann & Son, Inc., 1108 Chestnut Street, Philadelphia, manufacturer of musical instruments, has acquired a four-story factory, 56 x 72 ft., totaling about 16,000 sq. ft. of floor space, and will use for expansion.

The Reading Co., Philadelphia, has plans for a new pumping plant at its yards at Monocacy, Montgomery County, to cost upward of \$20,000 with machinery.

LeRoy B. Rothschild, 215 South Broad Street, Philadelphia, architect, has filed plans for an eight-story automobile service, repair and garage building, 60 x 80 ft., to cost \$250,000 with equipment.

The Provident Mutual Life Insurance Co., 401 Chestnut Street, Philadelphia, has completed plans for a new power house at Forty-eighth and Market Streets, to cost \$200,000 with equipment.

The Bureau of Maintenance and Repairs, City Hall, Philadelphia, has plans for a one-story shop and storage building, 50 x 110 ft., to cost about \$25,000 with equipment. John Molitor is city architect.

Rogers & Co., Inc., First Avenue, Royersford, Pa., manufacturer of fire brick, terra-cotta, etc., is completing plans for a new three-story plant, 60 x 140 ft., to replace a portion of the works recently destroyed by fire, with loss in excess of \$75,000. J. Vincent Poley, 162 Second Avenue, is architect. New equipment will be installed.

The General Laundry Machinery Corporation has been organized to take over the Willey-Ellis Co., with plants at Columbia, Pa., and Chicago, and the Tolhurst Machine Works, Inc., Troy and Green Island, N. Y., both manufacturers of laundry machinery and parts. The new company is arranging for a stock issue of 35,000 shares, a portion of the proceeds to be used for the merger and for proposed expansion in manufacturing facilities and distribution. The issue will total \$700,000.

Silverman & Levy, 313 South Smedley Street, Philadelphia, architects, will soon begin the erection of a four-story and basement automobile service, repair and garage building, 66 x 200 ft., to cost close to \$500,000 with equipment.

The Elliott-Fisher Co., Harrisburg, Pa., manufacturer of calculating and adding machines, book-keeping machines,

## The Crane Market

THERE is a fair volume of accumulated business in the market, to which was added in the past week the largest overhead crane inquiry that has appeared for some time. The Baldwin Locomotive Co. is in the market for forty-four 10-ton electric overhead cranes, eleven 10-ton and one 20-ton capacity crane bridges for its new Eddystone, Pa., plant. In the West, the Texas & Pacific Railway Co., Dallas, Tex., recently closed on two 100-ton overhead cranes and several smaller capacity cranes for new shops, the general contractor on which is the Austin Co., Cleveland. The Heltonville Limestone Co., Bedford, Ind., is in the market for a used 25-ton, 60-ft. span overhead electric crane, alternating current preferred. The 100-ton overhead crane for Henry L. Doherty & Co., 60 Wall Street, New York, has not yet been placed. In locomotive cranes, the two 20-ton standard railroad type for the New York Central Railroad are still pending and the Amtorg Trading Corporation, 165 Broadway, New York, has not yet awarded the remaining three 25-ton cranes on its list for export to Russia.

The Copperweld Steel Co., Glassport, Pa., is inquiring for two 5-ton overhead cranes. The National Tube Co., Pittsburgh, will close shortly on 9 cranes and auxiliary blooming mill equipment for its new seamless tube unit at Lorain, Ohio. The Missouri Pacific Railroad Co., St. Louis, is in the market for a 25-ton, 69-ft. span overhead crane.

Among recent purchases are:

Bylesby Engineering Corporation, Chicago, a 25-ton

standard locomotive crane for the Oklahoma City Gas & Electric Co., from the American Hoist & Derrick Co.

Kettle River Treating Co., Madison, Ill., a standard 25-ton locomotive crane with clamshell bucket from the American Hoist & Derrick Co.

Brooklyn Eastern District Terminal Co., Brooklyn, N. Y., a 10-ton gantry crane from the Niles Crane Corporation.

Caternacci Cut Stone Co., Newark, N. J., a 5-ton electric hoist from the Box Crane & Hoist Corporation.

Petroleum Iron Works, Sharon, Pa., a 50-ton, 60-ft. span, 4-motor, used Alliance overhead crane with 10-ton auxiliary, from F. H. Crawford & Co., 50 Church Street, New York.

American Sheet & Tin Plate Co., Pittsburgh, a 15-ton, 83-ft. span overhead crane for the New Castle works, from the Morgan Engineering Co.

Mississippi Valley Structural Steel Co., Melrose Park, Ill., two 20-ton and one 15-ton, 80-ft. span electric traveling cranes for a new shop, from a Western builder.

Indianapolis Light & Power Co., Indianapolis, a 10-ton, 40-ft. span overhead traveling crane from the Shaw Electric Crane Co.

Missouri Pacific Railroad Co., St. Louis, a 25-ton, 3-motor overhead traveling crane from the Whiting Corporation.

Great Lakes Supply Co., Chicago, a 1-ton and a 1½-ton underhung hand power crane from H. D. Conkey & Co.

etc., has engaged Harris & Richards, Drexel Building, Philadelphia, architects, to prepare plans for an addition to provide for increase in capacity.

The Keasby & Mattison Co., Ambler, Pa., manufacturer of asbestos and fire-proofing products, has concluded arrangements for the purchase of the former shipyard of the Traylor Shipbuilding Co., Cornwells, Pa., and will remodel the buildings for a new branch plant. Dr. Richard V. Mattison is one of the heads of the purchasing company.

The Arcadia Knitting Mills, Inc., 473 Kent Avenue, Brooklyn, is planning the complete electrification of its proposed new mill at Allentown, Pa. A power plant will be built for service. The entire project will cost more than \$90,000 with machinery. Jacoby & Everett, Allentown, are architects.

The Board of Education, New Castle, Pa., plans the installation of manual training equipment in a three-story addition to the senior high school, to cost \$250,000, for which new bids on revised plans will be asked soon. W. G. Eckles & Co., Lawrence Savings & Trust Building, are architects.

The Harrisburg Light & Power Co., Harrisburg, Pa., is arranging a fund of approximately \$1,500,000 for extensions and improvements in plants and system during the year, including the installation of additional equipment, new power substations, transmission lines, etc.

The Moore Drop Forging Co., Birnie Avenue, Springfield, Mass., has concluded negotiations for the purchase of the plant and business of the Anthracite Chain & Engineering Co., Hazleton, Pa. The new owner is said to be planning the early removal of the business to its Springfield works, where operations will be concentrated.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has filed plans for extensions and improvements in its shops on Thirtieth Street to cost about \$25,000.

## Buffalo

BUFFALO, June 6.

IDS will soon be asked by the White Motor Co., Cleveland, and 107 West Genesee Street, Syracuse, N. Y., manufacturer of motor trucks, for a three-story factory branch, service and repair building at Syracuse, to cost close to \$100,000 with equipment. R. Purcell is local manager.

The Vacuum Oil Co., Olean, N. Y., has acquired 532 ft. adjoining its present refinery for future expansion. Headquarters are at 61 Broadway, New York.

The Binghamton Brick Co., Binghamton, N. Y., has been making inquiries for an electric traveling crane, about 50 ft. span, with clam-shell bucket of ¾ to 1 yd. capacity.

The Board of Education, Gowanda, N. Y., contemplates the installation of manual training equipment in a new high school to cost \$275,000, for which plans will be prepared by Edward Green & Sons, and Albert H. Hopkins, 1 Niagara Square, Buffalo, architects.

The St. Regis Paper Co., Watertown, N. Y., has concluded arrangements for the purchase of a controlling interest in the Northeastern Power Corporation, operating an electric generating plant and transmission system in this section. The

purchasing company has arranged for an increase in capital from \$400,000 to \$750,000, a portion of the fund to be used for the acquisition and expansion. It is closely affiliated with the Northern New York Utilities, Inc., and other power interests in the Watertown district. F. L. Carlisle is president.

The Marcellus Casket Co., 101 Richmond Avenue, Syracuse, N. Y., has acquired property and plans the construction of an addition to cost in excess of \$35,000 with equipment.

The New York Central Railroad Co., Buffalo, is completing plans for the construction of a new power plant at its local yards to cost more than \$75,000 with equipment. Headquarters are at 466 Lexington Avenue, New York.

The Union Carbide Co., Union Street, Niagara Falls, N. Y., has plans for a new three-story building to cost about \$50,000.

The American Malleable Co., Lancaster, N. Y., has been sold and reorganized by the new owners under the name of the Lancaster Malleable & Steel Corporation. The plant, which has been idle for five months, will be put into immediate operation. W. B. Symmes is president of the new corporation.

## Cleveland

CLEVELAND, June 6.

MACHINE tool sales were light the past week and little inquiry is pending. One Cleveland machinery manufacturer purchased a 72-in. planer and a local locomotive crane builder bought a 7-ft. radial drill. The Guarantee Specialty Mfg. Co., Cleveland, purchased a Pratt & Whitney model B 6-in. vertical shaper. There is not much activity in automatic screw machines or in punching and shearing machinery. Presses are in fair demand. In the Detroit territory the Cadillac Motor Car Co. is adding a small amount of new equipment and the Ford Motor Co. is expected to purchase considerably more machinery for making its new model car.

The River Smelting & Refining Co., Cleveland, has taken bids for a new factory, 86 x 126 ft., two and three stories, to be erected at Bradley Road and the Baltimore and Ohio Railroad. Jacob Grodin is president; Allen Sogg is architect.

The Bingham Stamping & Tool Co., 1062 Post Street, Toledo, Ohio, will build a two-story factory addition.

The Cleveland Equipment & Engineering Co., Swetland Building, Cleveland, has removed its offices to 6306-10 Kinsman Road, where they will be combined with the company's warehouse.

The American Electric Switch Corporation, Minerva, Ohio, has been organized to manufacture safety switches, knife switches, panel boards and switchboards. The new corporation has taken over the American Electric Switch Co., and has acquired the plant formerly occupied by the Pet Milk Co. New equipment consisting of punch presses, drill presses, tapping machines and other machinery will be installed.



The Klein-Patterson Auto Body Co., 2335 East Twenty-second Street, Cleveland, is completing plans for a one-story addition, to cost about \$32,000 with equipment.

The Hickok Electric Instrument Co., 10514 Dupont Avenue, Cleveland, has awarded a general contract to R. E. Nixon, 2036 East 105th Street, for a two-story and basement addition, 30 x 45 ft., to cost about \$50,000 with equipment. The H. M. Morse Co., Finance Building, is architect and engineer.

The Air-Way Electric Appliance Co., 618 Broadway, Toledo, Ohio, has awarded a general contract to the A. Bentley & Sons Co., 201 Belmont Avenue, for a two-story addition to cost approximately \$60,000. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects.

The Cleveland Electric Illuminating Co., Cleveland, is planning the early erection of new power substations in different parts of the city, to cost more than \$500,000 with equipment. The work will be carried out in connection with the 1927 expansion program to represent a total investment of \$10,000,000.

The Weber Brass Co., Power Avenue, Cleveland, is considering a new four-story plant at East Twelfth Street and Emerald Court, about 35 x 125 ft., to cost approximately \$120,000 with equipment.

The Board of Education, Dennison, Ohio, plans the installation of manual training equipment in a new high school to cost \$300,000, for which revised plans are being drawn by H. Kerr Giffen, 1017 Twenty-second Street, Canton, Ohio, architect.

## Chicago

CHICAGO, June 6.

THE total volume of machine tool sales in May was a trifle ahead of April, but it is thought by some sellers that business in the first part of June will not be sustained at the May rate. While a fair amount of inquiry is before the trade, it is sluggish and new requests for prices are smaller in volume. Orders from the Santa Fe are coming out slowly. Other railroad business is practically at a standstill.

Used tools are in fair demand but prices obtained usually are low because of a seemingly large supply of this class of equipment. An inquiry made some time ago by the Chicago Board of Education for 12 speed lathes is active.

The Common Council, Richmond, Ill., will take bids for pumping equipment and an elevated steel tank and tower. The Wells Engineering Co., Geneva, Ill., is engineer.

The Central Steam Heat & Power Co., Muscatine, Iowa, is asking for a franchise for the construction of a central station to cost \$400,000 with equipment.

The City Council, Fairmont, Minn., is planning the installation of a 1000-kw. generator and accessory equipment. Howard Waite is secretary of the water and light commission.

The Arrow Machine Co., will build a brick machine shop, 33 x 125-ft., to cost \$10,000, at 1624 North Kilbourne Avenue, Chicago.

The Clute Mfg. Co., Cicero, Ill., manufacturer of door checks, has awarded the masonry contract for a one story factory.

J. A. Nelson, 1930 Hudson Avenue, Chicago, will build a one-story machine shop, 24 x 100-ft., to cost \$7,000. E. N. Braucher, 228 North La Salle Street, is architect.

The Motoramp Garages, Inc., Chicago, has plans under way for a ten-story service, repair and garage building, 100 x 125 ft., to cost \$1,100,000 with equipment. Arthur Lowenstein, formerly vice-president of Wilson & Co., Chicago, packers, is president; Harold N. Rosenheim is vice-president. A. S. Alshuler, 28 East Jackson Boulevard, is architect.

The Automobile Equipment Mfg. Co., 1908-12 Indiana Avenue, Chicago, plans to rebuild the portion of its plant destroyed by fire May 28, with loss reported at more than \$50,000 with equipment.

The International Harvester Co., 606 South Michigan Avenue, Chicago, is said to be completing plans for an addition at East Moline, Ill., to cost in excess of \$500,000 with machinery.

The Department of Public Works, Capitol Building, Springfield, Ill., is asking bids until June 24 for a new one or two-story furniture factory at the State reformatory at Pontiac, Ill., to cost \$55,000; also for a similar factory at the State penitentiary at Joliet, to cost approximately a like sum. W. J. Lindstrom, 608 South Dearborn Street, Chicago, is supervising engineer.

The Three Forks Portland Cement Co., Ideal Building, Denver, Colo., will soon begin the erection of a new mill at Hanover, Mont., with power house, machine shop and other buildings, to cost in excess of \$850,000 with machinery. J. C. Capper is general manager.

The Henson-Robinson Hardware Co., 812 East Adams Street, Springfield, Ill., is planning the erection of a three-story plant, 45 x 60 ft., reported to cost about \$65,000 with equipment.

The Anchor Mountain Mining Co., Deadwood, S. D., has authorized the immediate erection of a new cyanide mill at its properties, to cost in excess of \$75,000 with machinery. G. C. Kenworthy is general manager.

The Common Council, Beulah, Colo., is completing plans for a municipal electric light and power house to cost about \$25,000 with equipment. J. W. Carpenter is city clerk.

The Auto Ventilator Fan & Blower Co., 730 West Monroe Street, Chicago, has leased a new two-story factory, 125 x 135 ft., to be erected on North Kostner Avenue, to cost about \$50,000, and will establish its main plant at that location. L. E. Russell, 140 South Dearborn Street, is architect.

Louis Meyer, Red Wing, Minn., has plans for a one-story machine shop to cost about \$19,000 with equipment.

The Air Valve Ignition Co., Loveland, Colo., has been organized to manufacture air valve spark plugs. Equipment has been bought, and the company expects to have its factory in operation within 90 days.

The Falk Corporation, Milwaukee, has opened a branch office at 122 South Michigan Avenue, Chicago, which is in charge of C. H. Thomas. The company manufactures herringbone gears, speed reducers, steel castings, Diesel engines and flexible couplings.

H. D. Conkey & Co., Mendota, Ill., manufacturer of cranes, hoists, dryer cars and factory trucks has appointed the following representatives: Porter & Cole Co., Houston, Tex., in Louisiana, Texas, Oklahoma and southern Kansas districts; George F. Cribel Co., Buffalo, in the Buffalo territory, and Colwell & McMullin, Boston, in Massachusetts, Maine, Vermont, New Hampshire and Rhode Island.

G. H. Hedrick has opened an office at 300 West Adams Street, Chicago, for the Baush Machine Tool Co., Springfield, Mass. Particular attention will be paid to the application of multiple drilling of heavy beam sections.

Larson & McLaren, Baker Building, Minneapolis, Minn., architects, have plans for a three-story automobile service, repair and garage building to cost about \$150,000 with equipment. G. M. Orr & Co., Baker Building, are engineers.

The Colorado Compressed Air Co., 2101 Blake Street, Denver, Colo., will soon take bids for a new one-story and basement plant at Pueblo, Colo., to cost about \$75,000 with equipment. Walter DeMordaunt, First National Bank Building, Pueblo, is architect. C. O. Epperson is manager.

Ovens, power equipment, elevating and conveying machinery will be installed in the proposed new baking plant to be erected by the Consumers' Sanitary Coffee & Butter Stores, 5000 South Halsted Street, Chicago, to cost upward of \$500,000 with equipment. R. S. Smith, 111 Monroe Street, is architect. J. R. Roney is president.

## Milwaukee

MILWAUKEE, June 6.

INQUIRY for machine tools from the automotive industries is increasing. Sales continue to be limited by the conservative attitude of industry in general toward buying beyond strict replacement needs. The volume of business in May was moderate and represented a gain over April, although falling below that of last year. Large extensions of capacity in this territory are few. Used machinery is reported to be moving slowly, but stocks are not accumulating heavily.

The Milwaukee Electric Railway & Light Co., 215 Michigan Street, Milwaukee, has a program for 1927 involving an investment of \$3,300,000. Of this sum, \$1,621,500 has been set up for line extensions and additions to meet the growing use of power by industrial and domestic customers. Additional control and distribution equipment at the Lakeside steam generating plant will cost \$228,800. Completion of the steel tower, 132,000-volt transmission line from Kenosha, Wis., to the Illinois State line will cost \$370,800. George G. Post is chief electrical engineer.

The Western Printing & Lithographing Co., 213 State Street, Racine, Wis., has let the general contract to Olson Brothers, local, for the construction of a new printing plant costing \$500,000 on a new site. The Austin Co., is consulting engineer.

The Snap-On Wrench Co., 1270 South Pierce Street, Milwaukee, has increased its capital stock from \$100,000 to \$200,000 in view of proposed extensions of plant and capacity. Details have not yet been made public. The company manufactures manual tools, tool sets, etc.

The Madison Garage Co., Madison, Wis., is closing bids for the construction of an automotive sales and service build-

ing, 66 x 250 ft., two stories, designed by Flad & Moulton, local architects. It will cost about \$75,000.

Mead & Seastone, consulting engineers, Madison, Wis., have been engaged to design an addition to the steam generating plant of the Mississippi Valley Public Service Co., at Winona, Minn., to cost about \$75,000. One turbine unit will be required.

The Wisconsin Radiator Furniture Co., Mayville, Wis., has been organized to manufacture steel radiator cabinets and covers, and will soon begin production at its factory. The company is in the market for 14-gage and 16-gage coppered sheet steel.

The Wisconsin Gas & Electric Co., 305 Sixth Street, Racine, Wis., will build an artificial gas plant to cost \$500,000.

The Algoma Panel Co., Algoma, Wis., manufacturer of veneers and plywood products, has plans for a two-story addition to provide 20,000 sq. ft. of floor space.

The Milwaukee Gear Co., 1222 Third Street, Milwaukee, has let the general contract to W. O. Krahn, 623 Fifty-second Street, local, for a two-story addition, 40 x 44 ft.

Emil Lehmann, 1013 Center street, Milwaukee, manufacturer of ornamental iron work, has awarded contracts for the erection of a shop addition, 31 x 46 ft.

The American Home Equipment Co., Milwaukee, has been incorporated to manufacture dish washing machines and other labor-saving devices and appliances for the home. The principals are Stuart H. Markham, 509 Terrace Avenue, Charles D. Weeks, 318 Knapp Street, and Fred D. Clinton, 203 East Juneau Avenue. Plans for manufacturing are being formed but no details have as yet been given out.

The Stoughton Co., Stoughton, Wis., has been incorporated to acquire the assets of the Stoughton Wagon Co., manufacturer of motor trucks, motor buses and commercial car bodies, and is a reorganization of the wagon company, which was established more than 50 years ago to build farm wagons, carriages, etc. About eight years ago the production of motor vehicles was undertaken. The assets are valued at \$320,000. The new company will issue \$100,000 of first mortgage and \$300,000 of second mortgage bonds. The board of directors consists of Theodore M. Dahl, secretary White Motor Co., Cleveland; F. J. Vea, president Stoughton Wagon Co.; Price M. Davis, president Shadbolz & Boyd Co., Milwaukee; Emerson Ela, attorney, Madison, Wis., and C. S. Martins, vice-president State Bank of Madison.

## Cincinnati

CINCINNATI, June 6.

**M**ACHINE tool sales the past week have been rather light and are in contrast with the business transacted during the last half of May. Orders have consisted almost exclusively of single machines for delivery to widely scattered points. Inquiries continue in good volume and increased bookings are looked for during the remainder of June. A policy drawing forth comment from local builders is that of buyers in delaying purchases of machine tools, even though inquiries had been made several months previous, and then asking for rush delivery. Most of the recent bookings have been from the general industrial field.

Bids will soon be asked by the State Highway Department, Columbus, Ohio, for a one-story machine and repair shop, garage and equipment storage building near Chillicothe, Ohio, to cost about \$65,000 with equipment. H. B. Briggs, Hartman Hotel Building, Columbus, is architect.

The Steel Products Engineering Co., Springfield, Ohio, is completing plans for a one-story addition about 15 x 125 ft., between two existing buildings. The G. L. Ohmart Co., Springfield, is architect and engineer.

The Washington County Gas Co., Elizabethton, Tenn., is reported to be planning the construction of a new pipe line with compressor station, etc., for a distance of about 10 miles, estimated to cost \$100,000. George J. O'Neil, industrial engineer, Central Public Service Co., 209 South La Salle Street, Chicago, is in charge. Edward Wagner is general manager.

The Board of Education, Ludlow Building, Dayton, Ohio, is said to be planning the installation of manual training equipment in a two and three-story junior high school to cost \$450,000, for which bids will be asked on a general contract before the close of the month. Bruce Lloyd, Lowe Building, is architect.

The Hol-fast Bedlock Co., Nashville, Tenn., recently formed by John L. Dillard, 1206 Russell Street, and associates, is said to be planning the operation of a local plant for the manufacture of locking devices and kindred specialties used in furniture production.

The Acme Mills, Hopkinsville, Ky., has awarded a general contract to the Jones-Hettelsater Construction Co., Mutual

Building, Kansas City, Mo., for a new flour mill, to replace its plant recently destroyed by fire. It will cost close to \$200,000 with machinery.

The Water Department, J. R. Lynn, service director, Portsmouth, Ohio, is considering a report submitted by J. A. Hiller and C. H. Anderson, Cincinnati, consulting engineers, for extensions and improvements in the municipal waterworks, to include a new pumping plant to cost approximately \$166,000 with machinery.

The Schmutz Mfg. Co., Inc., Louisville, Ky., maker of sheet metal printing machinery, has removed its offices from 1202-1208 West Main Street, to 1600 West Main Street.

The Acme Radiator Shield Co., Inc., 48-50 Vine Street, Cincinnati, has been organized to manufacture sheet steel radiator covers and other radiator furniture. Equipment and raw materials for immediate needs have been purchased.

## Indiana

INDIANAPOLIS, June 6.

**T**HE Auburn Automobile Co., Auburn, Ind., is having plans prepared for an addition, totaling about 60,000 sq. ft. of floor space, to cost in excess of \$200,000 with equipment. A portion of the structure will be given over to the parts division. E. L. Cord is president. The company is now running on a production schedule of 100 cars per day.

The Cleveland Township Board of Education, South Whitley, Ind., plans the installation of manual training equipment in a new two-story high and grade school at Cuppy Hill to cost \$115,000, for which bids will be asked on a general contract before the close of the month. Griffith, Goodrich & Waterfall, 200 East Berry Street, Fort Wayne, Ind., are architects.

The LaSalle Extension University, 4101 South Michigan Avenue, Chicago, has acquired the plant and property of the Stenotype Co., Indianapolis, manufacturer of mechanical stenographic reporting machines and devices. The company has been inactive for several years. The acquisition includes machinery, jigs, tools, etc. The new owner plans improvements and will resume production at an early date.

The Plymouth Body Works, Plymouth, Ind., is considering the construction of a one-story addition, to cost about \$35,000 with equipment. It is understood that work will begin in the fall. Floyd Clausen is general manager.

The City Council, Anderson, Ind., is said to have plans under consideration for extensions and improvements in the municipal electric light and power plant and waterworks, to cost \$75,000 with equipment.

Chester G. Schiefer, 434 East Washington Street, Fort Wayne, Ind., local representative for the Hudson and Essex automobiles, is having plans completed for a two-story machine and repair shop and service building, to cost about \$45,000 with tools. Everett I. Brown, First National Bank Building, is architect.

The Heltonville Limestone Co., Bedford, Ind., is in the market for a used 24-in. lathe.

## Gulf States

BIRMINGHAM, June 6.

**P**LANs are being developed by the Standard Potash Co., Odessa, Tex., M. Agress, president, for a new plant about 10 miles from the city, to include mining facilities, refinery and other structures. The majority of the machinery will be electrically operated. The entire project is estimated to cost upward of \$500,000.

The Inland Utilities Co., 1310 Liberty Street, Kansas City, Mo., is reported to be planning the construction of a steam-operated electric generating plant in the vicinity of Eupora, Miss., to cost approximately \$200,000 with machinery. A transmission line will be built.

The Louisiana Central Lumber Co., Clarks, La., is planning the early purchase of a band mill and other wood-working equipment, to replace machinery destroyed in a recent fire, when total loss of \$450,000 was sustained.

The Lockney Cotton Oil Co., Lockney, Tex., has awarded a general contract to the J. S. Harrison Construction Co., Liberty National Bank Building, Waco, Tex., for a two-story mill, to cost about \$75,000 with equipment.

The Texas Electric Service Co., Odessa, Tex., an interest of the Texas Power & Light Co., Dallas, has work under way on a new steam-operated electric generating plant for service in the oil field in this vicinity, where transmission lines will be built. The initial unit will be followed by the installation of additional equipment. The entire plant is expected to cost more than \$750,000. M. J. McCall is division engineer, in charge.

The Bedford-Carthage Stone Co., 70 Schrimpf Street, Houston, Tex., has plans under consideration for a one-story



stone-fabricating mill, 100 x 300 ft., to cost about \$35,000 with machinery.

The Banner Ice Cream Co., Abilene, Tex., is completing plans for a one-story ice-manufacturing plant adjoining its ice cream factory, for an initial capacity of 50 tons daily. It is estimated to cost approximately \$100,000 with machinery.

The Corinth Machinery Co., Corinth, Miss., has acquired the plant and business of the Southern Engine & Boiler Works, Jackson, Miss., and will take immediate possession. The new owner is said to be planning the early removal of business to its Corinth works where operations will be consolidated.

The West Texas Utilities Co., Abilene, Tex., is said to be planning the construction of a new steam-turbo electric generating plant in the vicinity of San Angelo, Tex., with construction of transmission lines in different parts of Crane County. The entire project is expected to cost in excess of \$200,000.

The Alabama Water Service Co., Gadsden, Ala., is planning the construction of a one-story ice-manufacturing plant to cost about \$25,000 with machinery.

The Common Council, St. Martinsville, La., is planning the installation of pumping machinery in connection with extensions in the municipal waterworks. An elevated steel tank and tower, with capacity of 50,000 gal., will also be installed. A fund of \$60,000 has been arranged for the project.

The Northern Texas Traction Co., 400 Main Street, Fort Worth, Tex., is considering the construction of a bus service, repair and garage building, to cost about \$70,000 with equipment.

The Sarasota Cold Storage & Commission Co., Sarasota, Fla., has plans under way for a new ice-manufacturing and cold storage plant, to cost approximately \$100,000 with machinery.

The Big Three Welding & Equipment Co., Fort Worth and Houston, Tex., distributor in Texas and Oklahoma of arc welders manufactured by the Lincoln Electric Co., Cleveland, has opened a warehouse branch at 1 North Frankfort Street, Tulsa, Okla.

## Detroit

DETROIT, June 6.

PLANS are being prepared by the Haskelite Mfg. Corporation, Grand Rapids, Mich., manufacturer of veneer panels, etc., for an addition to cost about \$35,000 with equipment. Headquarters are at 133 West Washington Street, Chicago. George R. Meyercord is president.

The Yellow Coach Mfg. Co., 5801 West Dickens Street, Chicago, will build a new two-story plant at Pontiac, Mich., to cost upward of \$100,000. Henry E. Beyster, General Motors Building, Detroit, engineer for the Fisher Body Corporation, is preparing the plans.

The Grand Trunk Railway Terminal & Cold Storage Co., Detroit, operated by the Continental Terminals, Inc., Cleveland, recently organized to operate plants in a number of cities, has plans for a nine-story ice-manufacturing and cold storage plant on local site, reported to cost more than \$1,700,000 with equipment. The structure will comprise about 5,000,000 cu. ft. of space, of which approximately one-half will be used for ice-manufacture and the other half for refrigeration and cold storage. The company is disposing of a bond issue of \$2,100,000, a portion of the fund to be used for the project. Moores & Dunford, Inc., 110 East Forty-second Street, New York, is engineer.

The Packard Motor Car Co., East Grand Boulevard, Detroit, has work under way on extensions and improvements in its power plant to cost close to \$1,000,000, including equipment. A 6000-kw. steam turbo-generator and accessory machinery will be installed, including equipment for the utilization of wood shavings and scrap as fuel.

The Board of Education, Lansing, Mich., plans the installation of manual training equipment in a new high school in the eastern section of the city, to cost more than \$1,000,000, for which foundations will soon be laid. Pond & Pond, Martin & Lloyd, 6 North Michigan Avenue, Chicago, are architects; J. N. Churchill, Lansing, is associate architect.

Albert Kahn, Inc., Marquette Building, Detroit, architect, has completed plans for a three-story automobile service, repair and garage building, to cost about \$100,000 with equipment.

The Gibbs Welding Machine Co., Bay City, Mich., has plans under way for an addition to double approximately the present capacity. It is reported to cost in excess of \$35,000 with equipment.

The Chevrolet Motor Car Co., Flint, Mich., is arranging plans for three additional units, to cost about \$1,750,000 with machinery. One of the structures will be equipped for parts manufacture; another building will be located on site of an

existing office structure, which will be razed, and will be equipped for general production and assembling.

The Board of Education, 1354 Broadway, Detroit, is said to be planning the installation of manual training equipment in two new high schools, each three stories, to be known as the Thomas M. Cooley and David MacKenzie high schools, estimated to cost \$750,000 and \$400,000, in order noted. It is expected to ask bids on each structure before the close of the month. Donaldson & Meier, Penobscot Building, are architects for the first noted school, and Smith, Hinchman & Grylls, Marquette Building, architects for the other.

The Port Huron Sulphite & Paper Co., Port Huron, Mich., is completing plans for a one-story addition, to cost close to \$50,000 with equipment.

The Larson Motor Sales Co., Muskegon, Mich., has filed plans for a new three-story service, repair and garage building, 65 x 115 ft., to cost close to \$100,000 with equipment.

The Consolidated Concrete Machinery Co., with headquarters at Adrian, Mich., has been organized and is a merger of the Ideal Concrete Machinery Co., Cincinnati; the Adrian Castings Co., Adrian, Mich.; the Anchor Concrete Machinery Co., Adrian; the Universal Tamping Machinery Co., Peoria, Ill., and the Thomas W. Noble Co., Chicago. Eugene F. Olsen, founder of the Anchor company, will be president and general manager of the new corporation. Julius W. Freiberg, president and treasurer of the Ideal Concrete Machinery Co., will be chairman of the board of directors.

The Ajax Electric Co., Kalamazoo, Mich., has been organized to manufacture growlers for armature testing, electrical test benches for generator and starting motors testing, battery discharge sets and battery charging outfits. The company also expects to manufacture a compact demagnetizer for use in connection with magnetic chucks. It is not in the market for any equipment and is securing its materials from the sources which supplied the former Allen Electric Mfg. Co., the executive personnel of which it has retained in part.

## St. Louis

ST. LOUIS, June 6.

PLANS are being developed by the National Sales Machine Co., 1926 Chestnut Street, St. Louis, for a new factory for the production of vending machines and parts, to be ready for service early in July.

The Polar Wave Ice & Fuel Co., 3638 Olive Street, St. Louis, has filed plans for a new one-story ice-manufacturing plant, 150 x 155 ft., to cost close to \$100,000 with equipment.

The Lee Hardware Co., Salina, Kan., has awarded a general contract to Fred Hartley, Salina, for a new four-story storage and distributing plant, to cost upward of \$75,000 with equipment.

The Phillips Petroleum Co., Bartlesville, Okla., is arranging for the early construction of a new gasoline refinery at Sanford, Tex., to cost more than \$750,000 with machinery.

A traveling oven, power equipment, conveying and other machinery will be installed in the new plant to be constructed by the Fort Smith Biscuit Co., 201 South Fifth Street, Fort Smith, Ark., to cost close to \$100,000. The company was formed recently by C. H. Wortz and associates with a capital of \$150,000.

The Arkansas-Missouri Power Co., Walnut Ridge, Ark., has arranged for a bond issue of \$340,000 and preferred stock issue of \$200,000, a portion of the proceeds to be used for expansion in power plants, ice-manufacturing plants and other utilities.

The Board of Education, Ord, Neb., is said to be planning the installation of manual training equipment in a new two-story and basement high school, to cost \$135,000, for which bids will be asked on a general contract before the close of the month. Vorse, Kraetsch & Kraetsch, Commonwealth Building, Des Moines, Iowa, are architects.

Preston Bradshaw, International Life Building, St. Louis, architect, has completed plans for a three-story automobile service, repair and garage building, 90 x 100 ft., to cost \$100,000 with equipment.

The Common Council, Carter, Okla., plans the installation of deep-well pumping machinery in connection with proposed extensions and improvements in the municipal waterworks. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

The Wackman Welded Ware Co., 2420 South Seventh Street, St. Louis, has filed plans for a one-story addition, 30 x 82 ft.

The Black Brothers Flour Mill Co., Beatrice, Neb., has plans for the construction of a new mill at Wymore, Neb., to cost close to \$100,000 with machinery.

The Gravois Planing Mill Co., 3016 Juniata Street, St. Louis, has plans for a one-story addition, 121 x 125 ft., to cost about \$25,000.

The Western Ice Co., Shawnee, Okla., has plans under way for a new ice-manufacturing plant at Maud, Okla., to have an initial output of about 20 tons per day.

The National Sales Machine Co., 1922 Chestnut Street, St. Louis, has been organized to manufacture merchandise vending machines. Most of the equipment and materials has been contracted for and production will begin within the next two weeks.

## Pacific Coast

SAN FRANCISCO, June 1.

THE Board of Education, Riverside, Cal., plans the installation of manual training equipment in its proposed new junior high school in the Chemawa district to cost \$200,000. Alfred W. Rea and Charles E. Garstang, Pacific Southwest Bank Building, Los Angeles, are architects.

Richard D. King, Van Nuys Building, Los Angeles, architect, has plans for a six-story automobile service, repair and garage building, 100 x 125 ft., to cost approximately \$200,000 with equipment.

The Newcomer Trailer Mfg. Co., 1125 Santa Fe Avenue, Los Angeles, has filed plans for extensions and improvements to cost \$18,000.

The Sego Milk Products Co., Salinas, Cal., will soon begin the construction of a new one-story plant for the manufacture of cans, to cost about \$25,000 with equipment.

The Board of Regents, University of Arizona, Tucson, is asking bids until June 20 for two watertube boilers and auxiliary equipment for the power house.

The Parsons Casket Hardware Co., Belvidere, Ill., is completing plans for the first unit of a new plant at Richmond, Cal., to be one-story, 50 x 100 ft., to cost about \$45,000 with equipment.

S. N. Benjamin, 718 East Sixteenth Street, Los Angeles, architect, has plans for a new three-story factory, 91 x 140 ft., for the manufacture of furniture. It will cost about \$90,000.

The Board of City Trustees, Monrovia, Cal., plans the installation of pumping equipment and accessory machinery in connection with proposed extensions and improvements in the municipal waterworks. A special election has been called for June 14 to approve the bonds for \$235,000 for the project.

The American Glue Co., 2454 Hunter Street, Los Angeles, is said to be planning the early rebuilding of the portion of its plant destroyed by fire May 24, with loss in excess of \$40,000 including equipment.

The Wilmington Boat Works, Wilmington, Los Angeles, has plans for a new boat-building and repair works, including drydock, etc., to cost close to \$100,000 including equipment.

The City Council, Glendale, Ariz., is considering the installation of a municipal electric light and power plant, using a Diesel engine unit. Estimates of cost will soon be made.

The Bardsley Implement Co., Nampa, Idaho, farm implements, etc., has plans under way for a two-story factory, 76 x 106 ft. A portion of the structure will be used for storage and distributing service.

The Bakersfield Garage & Auto Supply Co., Twentieth and G Streets, Bakersfield, Cal., has plans under way for a new three-story service, repair and garage building, 115 x 125 ft., to cost about \$75,000 with equipment. Charles H. Biggar, Bank of Italy Building, is architect.

The Universal Machinery Mfg. Co., Sacramento, Cal., H. W. Funke, president, is said to be considering the erection of a foundry in the vicinity of Long Beach for the manufacture of steel castings. It is reported to cost in excess of \$50,000 with equipment.

The Metal Art Works, 1216 East Seventy-ninth Street, Los Angeles, has been organized to make art objects in bronze and iron, including hand forged hardware, grilles, railings, floor lamps, lighting fixtures, wall brackets, console tables, andirons, fire screens and other products. The company is in the market for materials and equipment.

The Liberty Ornamental Iron & Wire Works, Inc., Twenty-first and Filbert Streets, Oakland, Cal., has been organized with a capital stock of \$50,000 to manufacture ornamental iron fence, iron balconies, stair railings and woven wire products. A plant is in operation and the company also expects to handle a line of ornamental wire fence manufactured by an Eastern maker, as yet not decided upon.

The Waterhouse Signal Corporation, 295 South Fair Oaks Avenue, Pasadena, Cal., has been organized as a merger of the G. C. Waterhouse Co. and the Universal Traffic Signal Co. The personnel of the two companies will remain unchanged.

The Seattle, Wash., office of the Chain Belt Co., Milwaukee, manufacturer of Rex chains, transmission, elevating and conveying machinery, is now located at 1212 Sixth Avenue South.

Controlling interest in the Interstate Foundry Co., Longview, Wash., has been purchased by the Tennant Steel Casting Co., Tacoma. The purchased plant has not yet been completed, but is expected to be in operation in the near future.

## Canada

TORONTO, June 6.

BUYING by the Canadian Pacific Railway on the list for its Eastern and Western shops is still the most important feature in this market and dealers and builders are figuring on other lists from this source. The City Council, Toronto, also closed for several machines during the week. Single tool orders continue in good number and while many are from garages and repair plants, there is considerable buying of a diversified nature for replacement.

A better demand is appearing for rebuilt tools and some good business has been reported.

The Frid Construction Co., Hamilton, Ont., is in the market for a second-hand double drum hoisting engine 8 x 12 in.

The Town Council, Tiverton, Ont., contemplates installing an electric light plant and is interested in equipment.

The Town Council, Gore Bay, Ont., contemplates the erection of a power plant to cost \$11,000.

The Carter-Halls-Aldinger Co., Ltd., Royal Bank Building, Winnipeg, has been awarded the general contract by the United Grain Growers, Ltd., Bank of Hamilton Building, Winnipeg, for the construction of an elevator and shop at Port Arthur, Ont., to cost approximately \$2,500,000.

Bids are being received by Hutton & Souter, architects, 6 James Street South, Hamilton, Ont., for the construction of a stamping mill, machine shop, and an addition to the enameling plant at Oshawa, Ont., to cost \$750,000 for the General Motors Co. of Canada, Ltd.

Sullivan & Frid, 81 Victoria Street, Toronto, have been awarded contract for construction of a \$15,000 addition to the plant of the Central Spring Co., 133 Ritson Road North, Oshawa, Ont.

The Nipigon Corporation which has been operating a sulphite pulp mill at Nipigon for several years and has control of several large timber limits in Ontario, is completing arrangements for the erection of mills at Port Arthur, Ont., to cost \$7,000,000.

## Foreign

THE Penoles Metal Co., Monterey, Mexico, will make extensions and improvements in its smelting plant, including the installation of gas economizers and other equipment.

The Municipal Council, Sao Joao d'El Rei, Brazil, is completing plans for a municipal hydroelectric generating station with initial capacity of 4000 hp. It is proposed to increase the installation to 8000 hp. soon.

The Cuba Northern Railways Co., Puerto Tarafa, Cuba, an interest of the Consolidated Railroads of Cuba, Havana, is disposing of a bond issue of \$20,000,000 in the United States, a portion of the proceeds to be used for the extension of its line to Santa Clara, now under way, where connection will be made with the system of the Cuba Railroad Co., including rail and other construction, shop facilities, rolling stock, etc. Col. J. M. Tarafa is president.

The Government of Colombia, Bogota, is planning purchases of equipment in connection with proposed extensions in the Colombian Railways from Bogota to Puerto Nacional, and from the Caribbean Coast at Cartagena to Antioquia, Caldas and other points, including rolling stock, metal buildings, steel cable, derricks, air compressors, electric power equipment, railroad tools, shop machinery, steel rails, shovels, etc. The American Consulate, Bogota, has information regarding the projects.

Officials of Bernard Bandler & Sons, Inc., 8 West Fortieth Street, New York, have organized the Bahia Corporation to take over and develop the concession recently secured from the State of Bahia, Brazil, on black diamond, or mineral carbon deposits along the Paraguassu River in the Piranhas district. The producing fields are valued at over \$50,000,000. The company will install equipment for commercial production of the mineral deposits, used for the face of diamond drills and for other mechanical cutting purposes. Arthur S. Bandler is president; Alexander P. Rogers, general manager and consulting engineer; and Macambyra Monte Flores, consulting engineer in Brazilian operations.

The Sociedade Anonyma Industrial Hulha Branca, Rio de Janeiro, Brazil, has plans under way for the construction of a hydroelectric generating station at Curvello, State of Minas Geraes. A security issue has been sold to provide funds for the project.



## NEW TRADE PUBLICATIONS

**Motor-Driven Chain Draw-Benches.**—Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. Circular 810-G of 8 pages describes a recent development of chain draw-benches with worm-gear reduction. The machines are built in six sizes, with capacities ranging from 6000 to 50,000 lb. pull.

**Developments in Burning Powdered Coal.**—Combustion Engineering Corporation, 200 Madison Avenue, New York. Reprint in 8 pages of a paper by Henry Kreisinger, presented before the international conference on bituminous coal at Pittsburgh last November. It is well illustrated and deals with the development of furnaces cooled by water or steam, for burning powdered coal in steam-generating units. It is pointed out that these cooled furnace walls make it possible to take full advantage of turbulent mixing in the combustion space, which is necessary for high rates of combustion.

**Corliss Engines.**—Erie Ball Engine Co., Pittsburgh. Bulletin E-80A of 16 pages describes horizontal reciprocating engines of 100 to 800 hp., with one cylinder, and up to 1600 hp., compound. Illustrations are from typical installations. The description goes into details of many of the engine parts.

**Seamless Steel Products for High Pressures and Temperatures.**—Seamless Steel Equipment Corporation, 26 Broadway, New York. Catalog of 32 pages illustrating and describing products of two plants of the Press & Walzwerk Co., near Düsseldorf, Germany. Some of the work illustrated is of exceptional size, designed for high-pressure boiler drums or other containers.

**Centrifugal Steam Separator.**—Hagan Corporation, Pittsburgh. Twelve-page pamphlet describing a centrifugal steam separator for obtaining clean, dry steam and illustrating a number of types for varying service. The operation takes place in three stages, as described in the pamphlet.

**Large Steam Generators.**—International Combustion Engineering Corporation, Madison Avenue and Thirty-fifth Street, New York. Pamphlet of 28 pages describing and illustrating the remodeling of furnaces under steam boilers at the Fordson plant at the Ford Motor Co. As remodeled, the boilers are reported to have given double the previous amount of steam, reaching peaks of 500,000 lb. per hr., with an average of 380,000 lb. for almost a year. These are equivalent to boiler ratings of 660 and 500 per cent respectively. The pamphlet is thoroughly illustrated and gives sections of the boilers before and after changes were made.

**Small Tools.**—Whitman Barnes-Detroit Corporation, Detroit. Catalog 93, 176 pages, with numerous illustrations and tables, providing complete lists of types and sizes of tools manufactured by the company since its formation as a merger of the Detroit Twist Drill Co. and the Whitman & Barnes Mfg. Co. The catalog is adequately indexed, and among the tools listed are Hercules drills, miscellaneous drills, millimeter drills, reamers, cutters and end mills, counter bores and miscellaneous small tools.

**Rotary Blowers.**—Connersville Blower Co., Connersville, Ind. Bulletin 21C describing Victor rotary positive blowers for pressure or suction service. A table is included showing the net capacities of the blowers at different pressures and at maximum rated speed.

**Motor Valves.**—Eastern Electric Co., Hanover, Pa. Circular dealing with replacement motor valves, a feature of which is the welding of the heads and stems under time switches, in an attempt to eliminate internal strain and permit material to retain normal characteristics.

**Power Plant Equipment.**—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin H. O. 1900, containing a discussion of power plant practice, particularly as regards steam condensers, pumps, air compressors, Diesel Engines, gas engines and oil and water meters. The booklet contains much practical information for power plant and consulting engineers.

**Air Filters.**—Reed Air Filter Co., Inc., Louisville, Ky. Leaflet describing the Streamline automatic air filter, operated by means of oil gravitation.

**Electric Tools.**—Black & Decker Mfg. Co., Towson, Md. Catalog 14, 48 pages, handsome printed and illustrated, and containing descriptions of portable electric drills and stands, electric screw drivers and socket

wrenches, electric bench and pedestal grinders, electric twist drill grinders, portable electric grinders and tapers, portable electric valve grinders and electric valve refacers and attachments.

**Elevator Buckets.**—Weller Mfg. Co., 1320 North Kostner Avenue, Chicago. Leaflet briefly describing Salem elevator buckets, both standard and heavy weight for all sorts of material handling uses.

**Pipe Tools.**—Armstrong Brothers Tool Co., 317 North Francisco Avenue, Chicago. Catalog P-10 describing and listing the company's entire line of stocks and dies, pipe cutters, pipe vises, chain pipe tongs and pipe wrenches.

**Distribution Transformers.**—Wagner Electric Corporation, St. Louis. Bulletin 148 dealing with the company's single-phase distribution transformers of the HE type. The instruments are designed to supply the energy for all classes of lighting service, electric household appliances and small power loads, and are insulated for a high safety standard.

**Electric Motors.**—Reliance Electric & Engineering Co., Ivanhoe Road, Cleveland. Catalog section C, dealing with the type T heavy duty reliance motors for direct current drive. Illustrations of the motor in process of construction are included, as well as complete tables of ratings and other descriptive material.

**Copper Wire Drawing Machines.**—Vaughn Machinery Co., Cuyahoga Falls, Ohio. Folder briefly describing the company's line of copper wire drawing machines for continuous drawing which are manufactured under license from the Western Electric Co., Inc.

**Galvanized Iron.**—American Rolling Mill Co., Middletown, Ohio. "Revelations," a booklet containing the results of tests conducted by the company to ascertain the comparative resistance to corrosion of Armco ingot iron, copper bearing steel and other materials. The tests were conducted with sea air, sea water and brine.

**Handling Equipment.**—New Jersey Foundry & Machine Co. division, Henry B. Newhall Corporation, Garwood, N. J. Folder illustrating the different types of handling equipment produced by the company, particularly cranes and portable elevators.

**Heating and Power Plant Specialties.**—Kieley & Mueller, Inc., 34 West Thirteenth Street, New York. Supplement to general catalog briefly describing high pressure regulating valves, pressure regulators, pressure reducing valves, float valves, pump governors and other devices.

**Planing Mill Exhauster.**—B. F. Sturtevant Co., Hyde Park, Boston. Bulletin 303 dealing with the company's design 2, slow-speed, low-power planing mill exhauster of both the convertible and non-convertible types. Complete tables of performance are included as well as diagrams of construction and operation.

**Celite for Concrete.**—Celite Products Co., Los Angeles. Booklet of 16 pages devoted to the use of Celite mixed with cement in making Portland concrete. The proportions recommended vary with the richness of the mix, from 2 lb. to 5 lb. of Celite per bag of cement. Many illustrations are given of the use of this material for various construction purposes, including buildings, concrete sewer pipe, reservoirs, athletic stadia, tunnel facings, etc.

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